
Lower Passaic River Restoration Project

HABITAT IDENTIFICATION SURVEY DATA REPORT FOR THE LOWER PASSAIC RIVER STUDY AREA FALL 2010 FIELD EFFORT

FINAL

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Acronyms

| | |
|--------------|---|
| CPG | Cooperating Parties Group |
| ERA | ecological risk assessment |
| FS | feasibility study |
| GIS | geographic information system |
| HHRA | human health risk assessment |
| ID | identification |
| LPR | Lower Passaic River |
| LPRSA | Lower Passaic River Study Area |
| NJDEP | New Jersey Department of Environmental Protection |
| QAPP | quality assurance project plan |
| RI | remedial investigation |
| RM | river mile |
| USACE | US Army Corps of Engineers |
| USEPA | US Environmental Protection Agency |

1 Introduction

This data report presents the results of a habitat identification survey that was conducted in the Lower Passaic River Study Area (LPRSA) from September 20 to September 23, 2010. The survey was conducted under the authority of the May 2007 Settlement Agreement (Section IX.37.d.) (USEPA 2007) between the US Environmental Protection Agency (USEPA) and the Cooperating Parties Group (CPG), a consortium of approximately 70 companies that agreed to complete the remedial investigation and feasibility study (RI/FS) of the 17.4-mile stretch of the Passaic River from the mouth of the river at Newark Bay to Dundee Dam. The 2010 survey included qualitative observations along the right and left banks of the LPRSA from the mouth at Newark Bay up to Dundee Dam.¹ In addition, specific locations along three of the tributaries to the LPRSA (Second River, Third River, and Saddle River) were surveyed at the request of the US Army Corp of Engineers (USACE) and USEPA.

1.1 PURPOSE AND SCOPE

This report is part of the ongoing investigation of the LPRSA RI/FS. The data reported here are intended to support the planned ecological risk assessment (ERA) and human health risk assessment (HHRA). Specifically, this information will be used to qualitatively support the ERA² and HHRA in terms of identifying shoreline habitat availability and identifying areas for potential human access and activities in the LPRSA. The information may also be used in restoration planning under the Water Resources Development Act.

The purpose of the habitat identification survey was to qualitatively evaluate the shoreline of the LPRSA by documenting shoreline features, including bulkheads, riprap, and/or vegetation, as well as the types of vegetation present, including aquatic, scrub-shrub, or forested vegetation. This survey encompassed the tidal stretch of the LPRSA from the mouth of the river at Newark Bay to Dundee Dam, and 18 specific locations above the head of tide on three tributaries as requested by USACE. The three tributaries surveyed include: the Second River (confluence at approximately River Mile (RM) 8.0 in the main stem of the Lower Passaic River [LPR]), the Third River (confluence at approximately RM 11.3 in the LPR), and the Saddle River (confluence at approximately RM 15.6 of the LPR).

¹ The right bank and left bank are the terms used in this report to indicate the direction of the bank on the river when facing upstream. The right and left banks of the river generally correspond with the east/north and west/south banks, respectively.

² While this habitat survey will provide qualitative identification of shoreline features, it is not intended to support the delineation of ecological sediment exposure areas for evaluation in the ERA. Rather, the results of physical and chemical characterization of the LPRSA, along with the benthic invertebrate community, fish community, and avian surveys and the results of the ecological life history profiles based on a literature review will be used in ultimately defining ecological sediment exposure areas.

Shoreline characteristics (i.e., presence and extent of shoreline features and vegetation) were documented by scientists during the field survey; a video recorder was also used to document the surveyed shoreline. The boundaries of each shoreline feature and/or habitat type observed along each bank of the LPRSA during the survey were established using global positioning system coordinates and documented as waypoints to estimate the linear extent of shoreline categories and habitat types. Observations of human access points (e.g., parks, boat launches) and human uses of the LPRSA were also documented by AECOM staff, who accompanied the field crew from Windward Environmental LLC on the survey vessel.

1.2 DOCUMENT OVERVIEW

This report summarizes the methods and results of the 2010 habitat identification survey. The survey design and methodology are presented in Section 2. Survey results are summarized in Section 3 with results from the survey of the mainstem of the LPR provided in Section 3.1, and results from the survey of locations in the tributaries provided in Section 3.2. Section 4 summarizes the results of the habitat identification survey. References are provided in Section 5. The text is supported by the following appendices:

- ◆ Appendix A – Field Forms
- ◆ Appendix B – Field Notebook Entries
- ◆ Appendix C – Shoreline Video Survey (on CD)
- ◆ Appendix D – LPRSA Land Use and Shoreline Features for Human Access and Exposure Figure
- ◆ Appendix E – Photo Log

2 Survey Design and Methodology

The sampling design and methodology were presented in the *Lower Passaic River Restoration Project, Lower Passaic River Study Area RI/FS Habitat identification survey: Addendum to the Quality Assurance Project Plan. Surface sediment chemical analyses and benthic invertebrate toxicity and bioaccumulation testing. Addendum No. 3* (Windward 2010c), hereafter referred to as the Benthic Quality Assurance Project Plan (QAPP) Addendum No. 3. The scope of the effort for this survey was to evaluate the habitat along the shorelines and floodplains of the LPRSA. Primary data that were collected were estimated linear measurements of shoreline features (e.g., riprap, mixed vegetation, aquatic vegetation, bulkhead), including observations of habitat types and human access points (e.g., parks, boat launches), and human uses of the LPRSA. The survey included the 17.4-mile tidal stretch of the LPRSA from the mouth of the river at Newark Bay to Dundee Dam, as well as specific locations above the head of tide on the three tributaries (i.e., the Second River, Third River, and Saddle River).

2.1 SURVEY LOCATIONS

Both banks of the LPRSA were surveyed by boat on September 20 and 21, 2010, up to approximately RM 16. On September 21, 2010, three locations above RM 16.2 were accessed by land because the river was too shallow for a boat to safely navigate. The 146 waypoints within the LPRSA that were identified during the survey are listed in Table 2-1 and shown in Figure 2-1. The remaining portions of the river above RM 16 that were not surveyed by boat or land were documented by reviewing aerial photographs supplemented by Google® satellite images (images were dated 2010) to characterize the habitat and plant community. In addition, 18 tributary locations that were surveyed at locations above the head of tide as specifically requested by USACE and USEPA were accessed by and surveyed from land on September 22 and 23, 2010 (Table 2-2 and Figure 2-2). The coordinates and names of these locations were provided by USACE.

Table 2-1. Survey locations along the LPRSA

| Waypoint ID | Approximate RM | Bank ^a | Easting (X) ^b | Northing (Y) ^b |
|------------------|----------------|-------------------|--------------------------|---------------------------|
| 9/20/2010 | | | | |
| 1 | RM 13.4 | left | 596993 | 734133 |
| 2 | RM 13.4 | left | 596938 | 734001 |
| 3 | RM 13.4 | left | 596863 | 733798 |
| 4 | RM 13.3 | left | 596828 | 733557 |
| 5 | RM 13.1 | left | 596594 | 732179 |
| 6 | RM 13.0 | left | 596460 | 731764 |
| 7 | RM 12.9 | left | 596280 | 731493 |
| 8 | RM 12.7 | left | 595982 | 730628 |

Table 2-1. Survey locations along the LPRSA

| Waypoint ID | Approximate RM | Bank ^a | Easting (X) ^b | Northing (Y) ^b |
|-------------|----------------|-------------------|--------------------------|---------------------------|
| 9 | RM 12.2 | left | 596924 | 728043 |
| 10 | RM 12.1 | left | 596815 | 727225 |
| 11 | RM 11.9 | left | 596674 | 726430 |
| 12 | RM 11.6 | left | 596071 | 724917 |
| 13 | RM 11.5 | left | 595919 | 724699 |
| 14 | RM 11.4 | left | 595678 | 724415 |
| 15 | RM 11.4 | left | 595461 | 724232 |
| 16 | RM 11.4 | left | 595281 | 724148 |
| 17 | RM 11.3 | left | 595033 | 724051 |
| 18 | RM 11.2 | left | 594493 | 723955 |
| 19 | RM 11.1 | left | 594204 | 723824 |
| 20 | RM 11.0 | left | 593758 | 723695 |
| 21 | RM 10.4 | left | 592069 | 720904 |
| 22 | RM 10.3 | left | 592052 | 720508 |
| 23 | RM 10.2 | left | 592056 | 719712 |
| 24 | RM 10.0 | left | 591814 | 718841 |
| 25 | RM 8.8 | left | 590315 | 712986 |
| 26 | RM 8.5 | left | 589793 | 711939 |
| 27 | RM 8.4 | left | 589548 | 711443 |
| 28 | RM 8.5 | left | 589604 | 711548 |
| 29 | RM 8.0 | left | 589464 | 709291 |
| 30 | RM 8.0 | left | 589429 | 709193 |
| 31 | RM 7.9 | left | 589462 | 708642 |
| 32 | RM 7.8 | left | 588935 | 708053 |
| 33 | RM 7.6 | left | 588435 | 707532 |
| 34 | RM 7.2 | left | 587157 | 705730 |
| 35 | RM 7.2 | left | 587155 | 705424 |
| 36 | RM 7.0 | left | 586884 | 704452 |
| 37 | RM 6.6 | left | 586000 | 703094 |
| 38 | RM 6.3 | left | 585067 | 701176 |
| 39 | RM 6.1 | left | 585020 | 700454 |
| 40 | RM 6.0 | left | 585011 | 700044 |
| 41 | RM 5.8 | left | 584797 | 698771 |
| 42 | RM 5.6 | left | 584672 | 697939 |
| 43 | RM 5.6 | left | 584637 | 697700 |
| 44 | RM 5.5 | left | 584622 | 697299 |
| 45 | RM 5.4 | left | 584649 | 696631 |

Table 2-1. Survey locations along the LPRSA

| Waypoint ID | Approximate RM | Bank ^a | Easting (X) ^b | Northing (Y) ^b |
|-------------|----------------|-------------------|--------------------------|---------------------------|
| 46 | RM 5.1 | left | 585119 | 694901 |
| 47 | RM 5.0 | left | 585212 | 694524 |
| 48 | RM 4.9 | left | 585249 | 694330 |
| 49 | RM 4.7 | left | 586003 | 693035 |
| 50 | RM 4.3 | left | 587576 | 692227 |
| 51 | RM 3.9 | left | 590032 | 692452 |
| 52 | RM 3.7 | left | 590660 | 692981 |
| 53 | RM 3.6 | left | 590960 | 693549 |
| 54 | RM 3.5 | left | 591340 | 694209 |
| 55 | RM 3.4 | left | 591438 | 694369 |
| 56 | RM 3.3 | left | 591729 | 694599 |
| 57 | RM 3.3 | left | 591990 | 694782 |
| 58 | RM 3.1 | left | 592794 | 695069 |
| 59 | RM 3.0 | left | 593601 | 695111 |
| 60 | RM 2.9 | left | 593874 | 695151 |
| 61 | RM 2.8 | left | 594526 | 695188 |
| 62 | RM 2.5 | left | 595884 | 695315 |
| 63 | RM 2.4 | left | 596387 | 695286 |
| 64 | RM 2.2 | left | 597148 | 695060 |
| 65 | RM 2.1 | left | 597675 | 694699 |
| 66 | RM 2.0 | left | 597990 | 694330 |
| 67 | RM 1.7 | left | 598104 | 693022 |
| 68 | RM 1.5 | left | 597910 | 691860 |
| 69 | RM 1.4 | left | 597777 | 691256 |
| 70 | RM 1.3 | left | 597729 | 691017 |
| 71 | RM 1.2 | left | 597513 | 690236 |
| 72 | RM 0.1 | left | 596863 | 684373 |
| 73 | RM 0.3 | right | 598606 | 685910 |
| 74 | RM 0.4 | right | 598224 | 686324 |
| 75 | RM 0.9 | right | 597357 | 688518 |
| 76 | RM 1.9 | right | 598416 | 693801 |
| 77 | RM 2.6 | right | 595238 | 695605 |
| 78 | RM 3.1 | right | 592765 | 695301 |
| 79 | RM 3.2 | right | 592463 | 695166 |
| 80 | RM 3.2 | right | 592068 | 695022 |
| 81 | RM 3.4 | right | 591457 | 694726 |
| 82 | RM 3.5 | right | 591107 | 694437 |

Table 2-1. Survey locations along the LPRSA

| Waypoint ID | Approximate RM | Bank ^a | Easting (X) ^b | Northing (Y) ^b |
|------------------|----------------|-------------------|--------------------------|---------------------------|
| 83 | RM 3.9 | right | 589812 | 692708 |
| 84 | RM 4.1 | right | 588863 | 692548 |
| 85 | RM 4.3 | right | 587779 | 692528 |
| 86 | RM 4.4 | right | 587235 | 692385 |
| 87 | RM 4.6 | right | 586358 | 692840 |
| 88 | RM 5.4 | right | 584853 | 696432 |
| 89 | RM 6.2 | right | 585273 | 700806 |
| 90 | RM 6.4 | right | 585465 | 701594 |
| 91 | RM 6.5 | right | 585836 | 702482 |
| 92 | RM 6.7 | right | 586339 | 703123 |
| 93 | RM 7.1 | right | 587204 | 704811 |
| 94 | RM 7.4 | right | 587970 | 706506 |
| 95 | RM 8.3 | right | 589631 | 710912 |
| 96 | RM 8.4 | right | 589687 | 711302 |
| 9/21/2010 | | | | |
| 97 | RM 13.4 | left | 596988 | 734137 |
| 98 | RM 13.6 | left | 597276 | 734881 |
| 99 | RM 13.8 | left | 597332 | 736099 |
| 100 | RM 13.9 | left | 597252 | 736414 |
| 101 | RM 13.9 | left | 597223 | 736507 |
| 102 | RM 14.0 | left | 597135 | 736789 |
| 103 | RM 14.2 | left | 597428 | 738071 |
| 104 | RM 14.4 | left | 598286 | 738439 |
| 105 | RM 14.4 | left | 598565 | 738463 |
| 106 | RM 14.7 | left | 599392 | 737347 |
| 107 | RM 14.7 | left | 599384 | 737117 |
| 108 | RM 14.8 | left | 599511 | 736865 |
| 109 | RM 14.9 | left | 599723 | 736732 |
| 110 | RM 15.0 | left | 600207 | 736751 |
| 111 | RM 15.7 | left | 600016 | 740133 |
| 112 | RM 16.0 | left | 599307 | 741596 |
| 113 | RM 16.1 | left | 599098 | 741814 |
| 114 | RM 16.2 | left | 598853 | 742067 |
| 115 | RM 15.5 | right | 600764 | 739606 |
| 116 | RM 14.3 | right | 597794 | 738232 |
| 117 | RM 14.1 | right | 597400 | 737278 |
| 118 | RM 13.9 | right | 597305 | 736685 |

Table 2-1. Survey locations along the LPRSA

| Waypoint ID | Approximate RM | Bank ^a | Easting (X) ^b | Northing (Y) ^b |
|-------------|----------------|-------------------|--------------------------|---------------------------|
| 119 | RM 13.4 | right | 597124 | 734034 |
| 120 | RM 13.3 | right | 596995 | 733611 |
| 121 | RM 13.3 | right | 596944 | 733457 |
| 122 | RM 13.2 | right | 596815 | 732779 |
| 123 | RM 12.5 | right | 596609 | 729575 |
| 124 | RM 12.4 | right | 596874 | 728938 |
| 125 | RM 12.3 | right | 597079 | 728436 |
| 126 | RM 12.1 | right | 597063 | 727655 |
| 127 | RM 12.1 | right | 596998 | 727428 |
| 128 | RM 11.6 | right | 596228 | 724702 |
| 129 | RM 11.0 | right | 593410 | 723347 |
| 130 | RM 10.8 | right | 592722 | 722899 |
| 131 | RM 10.5 | right | 592340 | 721565 |
| 132 | RM 10.3 | right | 592245 | 720438 |
| 133 | RM 10.2 | right | 592217 | 719850 |
| 134 | RM 10.1 | right | 592224 | 719171 |
| 135 | RM 9.8 | right | 592056 | 717572 |
| 136 | RM 9.7 | right | 592218 | 717058 |
| 137 | RM 9.6 | right | 592320 | 716697 |
| 138 | RM 9.5 | right | 592414 | 716397 |
| 139 | RM 9.5 | right | 592427 | 716194 |
| 140 | RM 8.9 | right | 591015 | 713687 |
| 141 | RM 8.8 | right | 590716 | 713242 |
| 142 | RM 8.6 | right | 590038 | 712053 |
| 143 | RM 8.4 | right | 589710 | 711341 |
| 144 | RM 16.6 | right | 598009 | 744284 |
| 145 | RM 17.0 | right | 597017 | 746098 |
| 146 | RM 17.2 | right | 596139 | 746593 |

^a Left bank is the bank on the left of the river when facing upstream; right bank is the bank on the right of the river when facing upstream.

^b New Jersey State Plane (US survey ft).

ID – identification

LPR – Lower Passaic River

RM – river mile

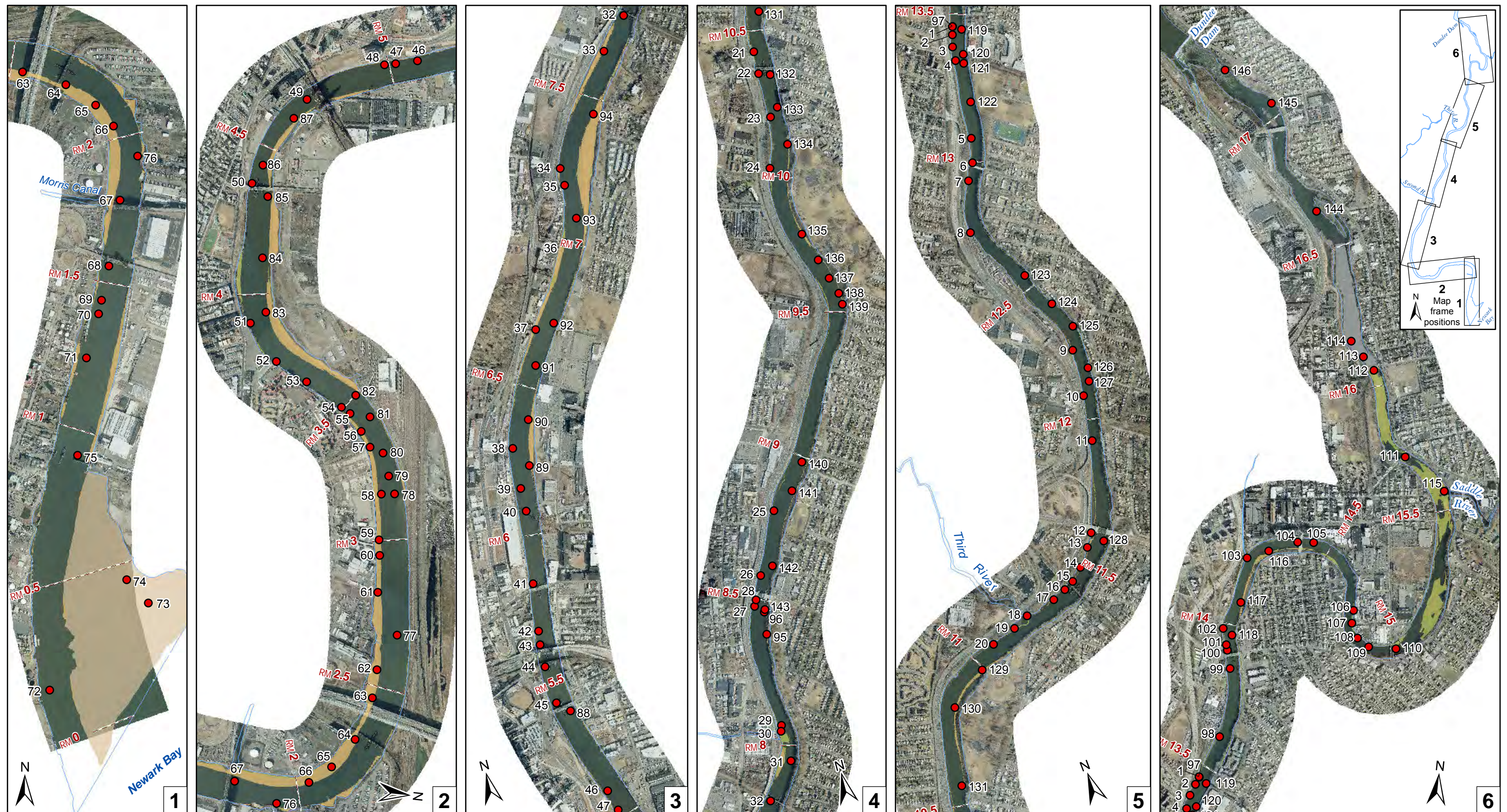


Table 2-2. Survey locations along the LPRSA tributaries

| Tributary | Location Name^a | Waypoint ID | Date Sampled | Easting (X)^b | Northing (Y)^b |
|------------------|----------------------------------|--------------------|---------------------|--------------------------------|---------------------------------|
| Saddle River | Arcola Pool Site | 163 | 09/22/10 | 604610 | 767075 |
| | County Park | 162 | 09/22/10 | 602480 | 771615 |
| | Felician College South | 160 | 09/22/10 | 603500 | 741031 |
| | Lodi Cemeteries | 161 | 09/22/10 | 604478 | 741348 |
| | Ox Bow | 159 | 09/22/10 | 601953 | 738955 |
| Second River | Belleville | 148 | 09/22/10 | 584669 | 711688 |
| | Bloomfield | 149 | 09/22/10 | 578532 | 712931 |
| | Mills | 151 | 09/22/10 | 573140 | 717467 |
| | Passaic | 147 | 09/22/10 | 587506 | 709880 |
| | Watsessing Park | 150 | 09/22/10 | 575420 | 712466 |
| | Wigwam Brook | 152 | 09/22/10 | 569943 | 709263 |
| Third River | Bonsal Wildlife Preserve | 157 | 09/22/10 | 578451 | 734445 |
| | Clarks Pond | 156 | 09/22/10 | 580481 | 725632 |
| | Clifton Pond | 158 | 09/22/10 | 592291 | 727905 |
| | Forest Hills Field Club | 155 | 09/22/10 | 579687 | 718053 |
| | Glen Ridge Country Club | 153 | 09/22/10 | 577286 | 722753 |
| | JFK Parkway | 154 | 09/22/10 | 577320 | 719921 |
| | River Mouth | 164 | 09/23/10 | 593848 | 725000 |

^a These are specific locations requested by USACE and considered to be potential LPRSA tributary restoration site locations.

^b New Jersey State Plane (US survey ft).

ID – identification

LPRSA – Lower Passaic River Study Area

USACE – US Army Corps of Engineers

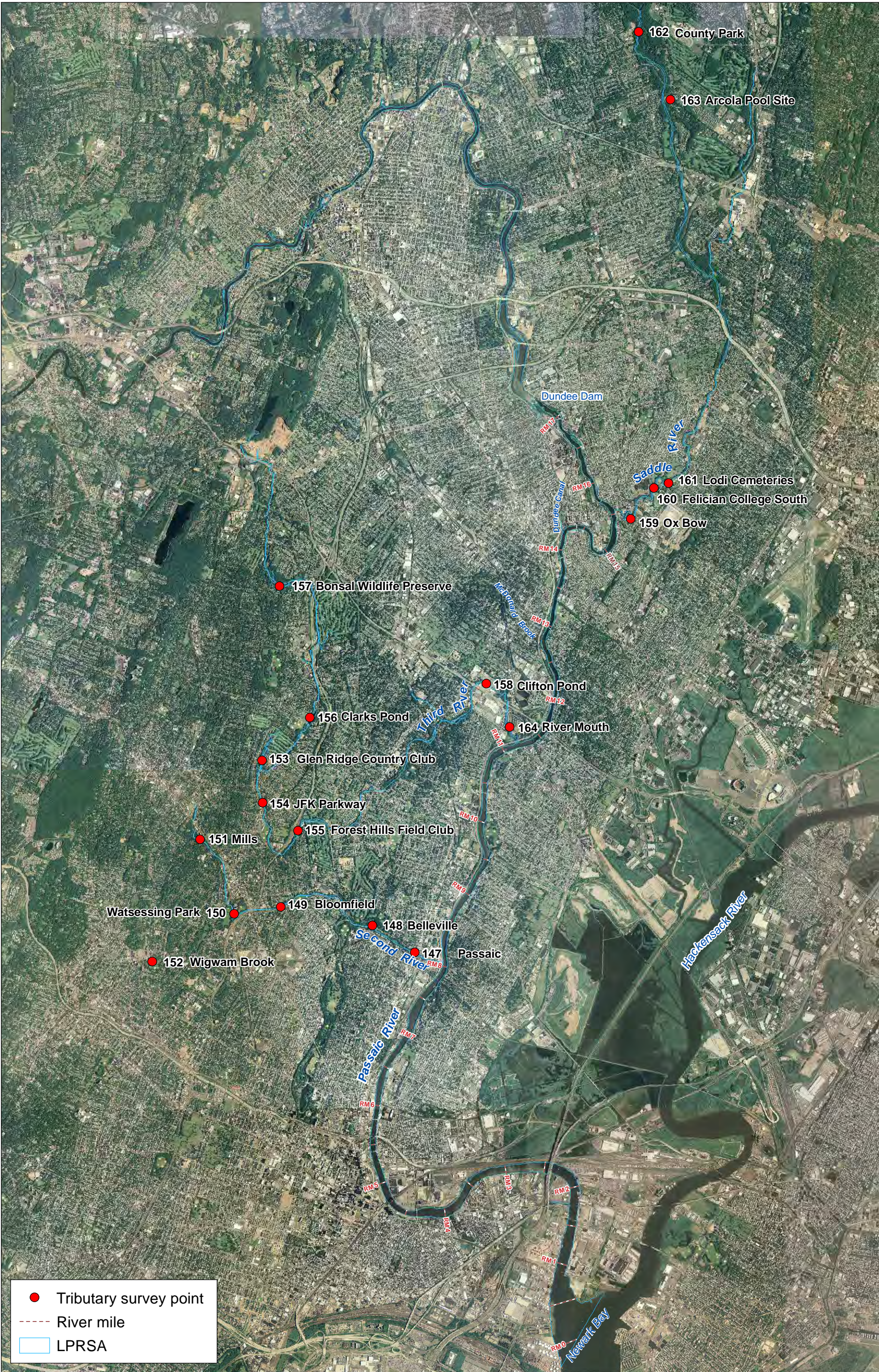


Figure 2-2. Habitat identification survey waypoints for the 2010 field effort in select LPRSA tributaries

2.2 SURVEY METHODS

This section discusses the survey methods for both the mainstem LPRSA and the tributary locations identified by USACE.

2.2.1 Survey methods for the mainstem LPRSA

In accordance with QAPP Addendum No. 3 (Windward 2010c), the habitat identification survey was conducted primarily by boat (to the extent possible) using a camera to record continuous video of the shoreline. The shoreline was accessed on foot when boat access wasn't possible. For the purpose of this survey, the shoreline was defined as the area immediately adjacent to the river that is visible by boat or readily accessible by foot (where boat access to the shoreline is not possible). Due to the fact that in most places on the LPRSA, the properties, parks, and roads along the river generally extend to the water's edge, the shoreline is generally a narrow area. Binoculars were used to examine vegetation features (e.g., leaves, bark, flowers) in order to identify plant species.

The shoreline was classified into the same four ecological risk assessment habitat classification categories relied upon by Tierra Solutions during their lower portion of the LPRSA in 1999 and 2000 (Tierra Solutions 2002):

- ◆ **Aquatic vegetation** – extent of shoreline with greater than 50% emergent vegetation (e.g., smooth cordgrass [*Spartina alterniflora*], common reed [*Phragmites australis*])
- ◆ **Bulkhead** – extent of shoreline where greater than 50% of the vertical face is composed of wood timbers, metal sheet pile, or large stone blocks
- ◆ **Mixed vegetation** – extent of shoreline where riprap or bulkhead and emergent vegetation or overhanging vegetation are present in roughly equal proportions.
- ◆ **Riprap** – extent of shoreline dominated by sloped banks that are covered by cobble to boulder-sized stones and/or concrete rubble

In addition to the four shoreline categories outlined above, the length of each mudflat along the shoreline that was exposed at the time of observation was recorded by collecting waypoint coordinates in the field that represented the boundary of the mudflat length.³ Mudflat areas were calculated using these waypoint coordinates to determine the mudflat length along the shoreline and aerial photographs of the LPR (GEOD 2007) to determine the shape of the mudflat and the distance that the mudflat extended from the shoreline. Geographic information system (GIS) spatial tools were then used to estimate the area of the mudflat.

³ The recorded length of each mudflat represents the length of the mudflat when encountered during the survey and not specifically at low tide. Therefore, the length of each mudflat provided in this report is not intended to represent the entire length of the mudflat.

Shoreline vegetation was identified to the species level when possible, and the plant community was classified into one of four groups:

- ◆ **Emergent vegetation** — Includes marsh vegetation such as smooth cordgrass [*Spartina alterniflora*] and common reed [*Phragmites australis*].
- ◆ **Mixed forest** — Includes all trees that provide canopy cover such as silver maple (*Acer saccharinum*).
- ◆ **Shrub/scrub** — Includes shrub/scrub species, such as groundsel tree (*Baccharis halimifolia*).
- ◆ **None** — Includes few or no plants.

At those locations above RM 16 that could not be accessed by boat, the field survey was conducted using the same methods described above, except that the survey was conducted by field personnel on foot. The shorelines of these areas were accessed at public access points (i.e., areas accessible by walking from the road or parking lots to the river). Given that these locations could not be surveyed and videotaped from a boat, continuous video recording was conducted to the extent possible. After the field survey was completed, the 2007 LPRSA aerial photograph survey (GEOD 2007) was used to identify shoreline features and characterize the habitat types and plant community for areas of the shoreline that were not visible in the areas surveyed by foot. Field forms and field notes are presented in Appendices A and B, respectively. Appendix C presents the shoreline video.

Shoreline features and uses pertinent to human activities and potential exposures along the mainstem of the LPRSA were documented separately by AECOM staff during the habitat identification survey following methods detailed in the Benthic QAPP Addendum No. 3, specifically, the LPRSA Human Access/Exposure Identification Survey Form in Attachment T (Windward 2010c). Shoreline types were identified based on field observations, videotape, and photo documentation, and categorized according to features relevant to the potential for human access and exposure. Three predominant shoreline types were noted:

- ◆ Natural/vegetated
- ◆ Riprap/stone
- ◆ Sheet pile/bulkhead

Areas with mixed vegetation overhanging bulkhead were classified as bulkhead and areas of mixed vegetation overhanging riprap were classified as riprap, when the bulkhead or riprap was the more dominant shoreline feature. This approach differed from the approach taken to classify ecological habitat, which focused on abundance and type of vegetation (Tierra Solutions 2002). Additional observations relevant to human use of the LPRSA, included noting potential public access points (e.g., boat launches/docks, foot paths), and evidence of human use of the LPRSA predominant adjoining land uses, and activities ongoing at the time of the survey.

2.2.2 Survey methods for the tributaries

The 18 tributary survey locations along the Saddle River, Second River, and Third River identified by USACE were not accessible by boat because each of these rivers was too shallow. The shorelines of these areas were accessed at public-access points. Field personnel drove to the locations and then accessed them on foot. Shoreline vegetation was surveyed to the extent possible and categorized as described in Section 2.2.1, with the exception that human access points were not evaluated at the tributary survey locations. To the extent possible, the shoreline was video recorded. Binoculars were used to examine vegetation features (e.g., leaves, bark, flowers) in order to identify plant species.

2.3 DEVIATIONS

No deviations from protocols presented in the Benthic QAPP Addendum No. 3 (Windward 2010c) were necessary during the 2010 habitat identification survey.

3 Survey Results

This section summarizes the observations recorded during the habitat identification survey, including those related to shoreline characterization; extent of mudflats; plant community types; habitat features, where available; incidental wildlife observations; and human access areas.

3.1 SURVEY OF THE MAINSTEM LPRSA

This section presents the observations recorded on September 20 and 21, 2010, during the survey of the mainstem LPRSA. Supporting documentation (field forms and field logbook entries), video footage, a figure that shows land use and shoreline features for human access and exposure, and photographs are provided in Appendices A through E.

3.1.1 Summary of LPRSA shoreline characterization

The LPRSA shoreline is generally divided into two main areas: a lower portion, which is largely characterized by a developed shoreline with structures that abut industrial properties and an upper portion characterized by more mixed vegetation that abuts roads, parks, and residential properties. Bulkhead was predominant (measured as length along the shoreline) in the more industrially developed lower portions of the LPRSA (RM 0 to RM 8 of the LPRSA), whereas, the shoreline along the upper portion (i.e., above RM 8) was dominated by mixed vegetation (Table 3-1). A map that shows the shoreline characterization along both banks is presented as Figure 3-1.

Table 3-1. LPRSA shoreline categories by river mile

| RM Segment | Waypoint ID | Shoreline Category | Length (ft) | Percentage of Total Shoreline ^a |
|-------------------------------|---------------------------|-------------------------------|-------------|--|
| Left Bank^b | | | | |
| RM 0.0 – RM 1.2 | 71 – 72 | bulkhead | 7,397 | 7.9 |
| RM 1.2 – RM 1.3 | 70 – 71 | riprap | 980 | 1.0 |
| RM 1.3 – RM 1.4 | 69 – 70 | bulkhead | 198 | 0.2 |
| RM 1.4 – RM 1.6 | 68 – 69 | riprap | 744 | 0.8 |
| RM 1.6 – RM 2.0 | 66 – 68 | mixed vegetation | 2,430 | 2.6 |
| RM 2.0 – RM 2.3 | 64 – 66 | bulkhead | 943 | 1.0 |
| RM 2.3 – RM 2.6 | 62 – 64 | aquatic vegetation | 1,455 | 1.5 |
| RM 2.6 – RM 2.8 | 61 – 62 | mixed vegetation | 1,459 | 1.6 |
| RM 2.8 – RM 3.3 | 57 – 61 | bulkhead | 2,636 | 2.8 |
| RM 3.3 – RM 3.4 | 56 – 57 | riprap | 309 | 0.3 |
| RM 3.4 – RM 3.5 | 54 – 56 | bulkhead | 532 | 0.6 |
| RM 3.5 – RM 3.6 | 53 – 54 | riprap | 761 | 0.8 |
| RM 3.6 – RM 3.7 | 52 – 53 | bulkhead | 639 | 0.7 |
| RM 3.7 – RM 4.4 | 50 – 52 | mixed vegetation | 3,468 | 3.7 |
| RM 4.4 – RM 7.2 | 35 – 50 | bulkhead | 15,439 | 16.4 |
| RM 7.2 – RM 7.3 | 33 – 35 | mixed vegetation | 361 | 0.4 |
| RM 7.3 – RM 7.9 | 31 – 33 | bulkhead | 3,750 | 4.0 |
| RM 7.9 – RM 8.0 | 30 – 31 | mixed vegetation | 473 | 0.5 |
| RM 8.0 – RM 8.5 | 28 – 30 | bulkhead | 2,434 | 2.6 |
| RM 8.5 – RM 8.6 | 26 – 28 | mixed vegetation | 443 | 0.5 |
| RM 8.6 – RM 8.8 | 25 – 26 | bulkhead | 1,150 | 1.2 |
| RM 8.8 – RM 11.2 | 19 – 25 | mixed vegetation | 12,880 | 13.7 |
| RM 11.2 – RM 11.3 | 18 – 19 | bulkhead | 293 | 0.3 |
| RM 11.3 – RM 11.9 | 11 – 18 | mixed vegetation | 3,661 | 3.9 |
| RM 11.9 – RM 12.1 | 10 – 11 | bulkhead | 806 | 0.9 |
| RM 12.1 – RM 13.1 | 5 – 10 | mixed vegetation | 5,309 | 5.6 |
| RM 13.1 – RM 13.5 | 1 – 5 | bulkhead | 2,024 | 2.2 |
| RM 13.5 – RM 14.7 | 97 – 106 | mixed vegetation | 7,173 | 7.6 |
| RM 14.7 – RM 14.8 | 106 – 107 | bulkhead | 229 | 0.2 |
| RM 14.8 – RM 16.2 | 107 – 114 | mixed vegetation | 7,052 | 7.5 |
| RM 16.2 – RM 16.6 | not assigned ^c | mixed vegetation ^d | 2,351 | 2.5 |
| RM 16.6 – RM 16.7 | not assigned ^c | bulkhead ^d | 406 | 0.4 |
| RM 16.7 – RM 17.4 | not assigned ^c | mixed vegetation ^d | 3,864 | 4.1 |
| Right Bank^e | | | | |
| RM 0.0 – RM 0.4 | 73 – 74 | aquatic vegetation | 214 | 0.2 |
| RM 0.4 – RM 0.9 | 74 – 75 | riprap | 2,383 | 2.6 |

Table 3-1. LPRSA shoreline categories by river mile

| RM Segment | Waypoint ID | Shoreline Category | Length (ft) | Percentage of Total Shoreline ^a |
|-------------------|---------------------------|-------------------------------|-------------|--|
| RM 0.9 – RM 1.9 | 75 – 76 | bulkhead | 5,582 | 6.0 |
| RM 1.9 – RM 2.7 | 76 – 77 | mixed vegetation | 4,840 | 5.2 |
| RM 2.7 – RM 3.2 | 77 – 79 | bulkhead | 2,922 | 3.1 |
| RM 3.2 – RM 3.3 | 79 – 80 | aquatic vegetation | 367 | 0.4 |
| RM 3.3 – RM 4.4 | 80 – 85 | mixed vegetation | 5,875 | 6.3 |
| RM 4.4 – RM 6.2 | 85 – 89 | bulkhead | 9,894 | 10.7 |
| RM 6.2 – RM 6.4 | 89 – 90 | mixed vegetation | 873 | 0.9 |
| RM 6.4 – RM 6.6 | 90 – 91 | riprap | 928 | 1.0 |
| RM 6.6 – RM 6.7 | 91 – 92 | bulkhead | 810 | 0.9 |
| RM 6.7 – RM 8.5 | 92 – 96 | mixed vegetation | 9,215 | 9.9 |
| RM 8.5 – RM 10.2 | 133 – 143 | mixed vegetation | 9,843 | 10.6 |
| RM 10.2 – RM 10.4 | 132 – 133 | bulkhead | 669 | 0.7 |
| RM 10.4 – RM 13.3 | 120 – 132 | mixed vegetation | 16,186 | 17.4 |
| RM 13.3 – RM 13.4 | 119 – 120 | bulkhead | 432 | 0.5 |
| RM 13.4 – RM 14.0 | 118 – 119 | mixed vegetation | 2,870 | 3.1 |
| RM 14.0 – RM 14.3 | 116 – 118 | bulkhead | 1,598 | 1.7 |
| RM 14.3 – RM 15.6 | 115 – 116 | mixed vegetation | 7,104 | 7.6 |
| RM 15.6 – RM 16.6 | not assigned ^c | mixed vegetation ^d | 6,155 | 6.6 |
| RM 16.6 | 144 | mixed vegetation | na | 0.0 |
| RM 16.6 – RM 17.1 | not assigned ^c | mixed vegetation ^d | 2,173 | 2.3 |
| RM 17.2 – RM 17.4 | not assigned ^c | mixed vegetation ^d | 899 | 1.0 |
| RM 17.1 – RM 17.2 | 145 – 146 | mixed vegetation | 1,047 | 1.1 |

^a Percentage of total shoreline along the identified bank (i.e., left or right).

^b Left bank is the bank on the left of the river when facing upstream.

^c Waypoint ID was not assigned because area of shoreline could not be access by boat or on foot.

^d Shoreline category was determined by reviewing aerial photographs supplemented by satellite images.

^e Right bank is the bank on the right of the river when facing upstream.

LPRSA – Lower Passaic River Study Area

na – not applicable

RM – river mile



Figure 3-1. LPRSA shoreline habitat classifications

Roughly two-thirds of the shoreline along the LPRSA were classified as mixed vegetation, and one-third was classified as bulkhead and/or riprap; approximately 1% of the LPRSA shoreline was classified as aquatic vegetation (Table 3-2). The left bank had more bulkhead than did the right bank because Highway 21 directly abuts and runs parallel to the river along the left bank. The area of the shoreline where Highway 21 runs parallel to the river is characterized largely by steep concrete walls. The right bank had more mixed vegetation than did the left bank; aquatic vegetation was comparable along both banks and was primarily limited to fringe areas along intertidal mudflats. Many of the shoreline areas categorized as mixed vegetation had riprap and/or bulkhead with overhanging vegetation.

Table 3-2. Percentage of shoreline categories along the LPRSA

| Shoreline Category | Left Bank ^a | | Right Bank ^b | | Total Shoreline | |
|--------------------|------------------------|--|---------------------------|--|-----------------|------------|
| | Length (ft) | Percentage of Total Shoreline ^c | Length (ft) | Percentage of Total Shoreline ^c | Length (ft) | Percentage |
| Aquatic vegetation | 1,455 | 1.6 | 581 | 0.6 | 2,036 | 1.1 |
| Bulkhead | 38,876 | 41.3 | 21,907 | 23.6 | 60,783 | 32.5 |
| Mixed vegetation | 50,924 | 54.1 | 67,080 | 72.2 | 118,004 | 63.1 |
| Riprap | 2,794 | 3.0 | 3,311 | 3.6 | 6,105 | 3.3 |
| Total | 94,049 | | 92,879^d | | 186,928 | |

^a Left bank is the bank on the left of the river when facing upstream.

^b Right bank is the bank on the right of the river when facing upstream.

^c Percentage of total shoreline along the identified bank (i.e., left or right).

^d Length of total shoreline along the right bank does not include the eastern portion of the Kearny Point mudflat (i.e., the portion of shoreline along the Hackensack River).

LPRSA – Lower Passaic River Study Area

Mudflats were present along 35% of the total LPRSA shoreline (Table 3-3) and were more prevalent in the lower portions of the LPRSA (i.e., below RM 8). Ninety percent of the left bank mudflats were below RM 8, and 62% of the right bank mudflats were below RM 8. Mudflats were documented in similar proportions along each bank of the entire length of the mainstem LPRSA (i.e., 14% of the left bank and 21% of the right bank). In contrast, the areal extent of the mudflats along the right bank was much greater than that of the left bank (i.e., 91% versus 9%, respectively, of the total mudflat area in the LPRSA) because of the inclusion of the Kearny Point mudflat.⁴

⁴ The Kearny Point mudflat was not exposed at the time of the survey and, therefore, was not documented in the field notes as a mudflat. At the request of USEPA, the Kearny Point mudflat has been included in this report (Table 3-3), and the length and area of the mudflat were estimated from aerial photographs of the LPR (GEOD 2007).

Table 3-3. Mudflats along the length of the LPRSA

| RM Segment | Waypoint ID | Length (ft) ^a | Percentage of Total Mudflat per Bank ^b | Percentage of Bank that is Mudflat ^c | Mudflat Area (sq ft) ^d | Percentage of Area per Bank |
|-------------------------------|-----------------|--------------------------|---|---|-----------------------------------|-----------------------------|
| Left Bank^e | | | | | | |
| RM 1.3 – RM 1.4 | 70 – 71 | 980 | 7.5 | 1.0 | 52,339 | 10.4 |
| RM 1.8 – RM 2.2 | 65 – 67 | 1,553 | 11.9 | 1.7 | 42,483 | 8.4 |
| RM 2.3 – RM 2.8 | 61 – 64 | 2,914 | 22.4 | 3.1 | 153,148 | 30.3 |
| RM 2.9 – RM 3.0 | 59 – 60 | 336 | 2.6 | 0.4 | 9,489 | 1.9 |
| RM 3.2 – RM 3.3 | 57 – 58 | 840 | 6.5 | 0.9 | 20,390 | 4.0 |
| RM 3.4 – RM 3.5 | 55 – 56 | 360 | 2.8 | 0.4 | 6,197 | 1.2 |
| RM 3.9 – RM 4.4 | 50 – 51 | 2,636 | 20.3 | 2.8 | 108,744 | 21.5 |
| RM 4.9 – RM 5.0 | 47 – 48 | 332 | 2.6 | 0.3 | 12,380 | 2.5 |
| RM 5.6 – RM 5.7 | 42 – 43 | 252 | 1.9 | 0.3 | 2,719 | 0.5 |
| RM 6.7 – RM 7.0 | 36 – 37 | 1,627 | 12.5 | 1.7 | 56,783 | 11.2 |
| RM 8.0 – RM 8.1 | 29 – 30 | 100 | 0.8 | 0.1 | 966 | 0.2 |
| RM 11.1 – RM 11.2 | 18 – 19 | 293 | 2.3 | 0.3 | 15,651 | 3.1 |
| RM 11.3 – RM 11.4 | 16 – 17 | 273 | 2.1 | 0.3 | 7,750 | 1.5 |
| RM 11.4 – RM 11.5 | 14 – 15 | 284 | 2.2 | 0.3 | 9,352 | 1.9 |
| RM 14.7 – RM 14.8 | 106 – 107 | 229 | 1.8 | 0.2 | 7,234 | 1.4 |
| Total | | 13,009 | | 13.8 | 505,625 | |
| Right Bank^f | | | | | | |
| RM 0 – RM 0.9 | nd ^g | 4,333 | 22.0 | 4.6 | 4,101,623 | 81.5 |
| RM 3.2 – RM 3.3 | 78 – 79 | 489 | 2.5 | 0.5 | 16,767 | 0.3 |
| RM 3.5 – RM 3.9 | 82 – 83 | 2,383 | 12.1 | 2.5 | 118,524 | 2.4 |
| RM 4.2 – RM 4.4 | 84 – 85 | 1,373 | 7.0 | 1.4 | 109,653 | 2.2 |
| RM 4.4 – RM 4.7 | 86 – 87 | 960 | 4.9 | 1.0 | 30,913 | 0.6 |
| RM 6.2 – RM 6.4 | 89 – 90 | 873 | 4.4 | 0.9 | 36,233 | 0.7 |
| RM 7.1 – RM 7.4 | 93 – 94 | 1,850 | 9.4 | 1.9 | 219,701 | 4.4 |
| RM 8.4 – RM 8.5 | 95 – 96 | 358 | 1.8 | 0.4 | 7,257 | 0.1 |
| RM 8.8 – RM 9.0 | 141 – 142 | 1,349 | 6.8 | 1.4 | 31,693 | 0.6 |
| RM 9.6 – RM 9.7 | 136 – 138 | 927 | 4.7 | 1.0 | 74,573 | 1.5 |
| RM 9.8 – RM 10.1 | 134 – 135 | 1,683 | 8.5 | 1.8 | 89,751 | 1.8 |
| RM 10.6 – RM 11.0 | 129 – 131 | 2,159 | 10.9 | 2.3 | 134,305 | 2.7 |
| RM 14.1 – RM 14.3 | 116 – 117 | 1,002 | 5.1 | 1.1 | 61,874 | 1.2 |
| Total | | 19,739 | | 20.8 | 5,032,867 | |
| Combined Total | | 32,748 | | 34.6 | 5,538,492 | |

^a Length of mudflat as measured along the shoreline at the time that the survey was conducted.

^b Percentage of total mudflat length along the identified bank (e.g., left or right).

^c Left bank has 94,094 ft of shoreline; right bank has 95,059 ft of shoreline, which includes 2,180 ft of shoreline along the eastern portion of the Kearny Point mudflat (i.e., on the Hackensack River) not surveyed during the habitat identification survey.

- ^d Mudflat areas were calculated using the field-collected waypoint coordinates to determine the mudflat length along the shoreline and aerial photographs of the LPR (GEOD 2007) to determine the shape of the mudflat and the distance that the mudflat extended from the shoreline. GIS spatial tools were then used to estimate the area of the mudflat.
- ^e Left bank is the bank on the left of the river when facing upstream.
- ^f Right bank is the bank on the right of the river when facing upstream.
- ^g The Kearny Point mudflat was not exposed at the time of the survey and, therefore, was not documented in the field notes as a mudflat. At the request of USEPA, the Kearny Point mudflat has been included in this table, and the total length of the mudflat (includes the length of the mudflat along the LPR and the Hackensack River) and the total area of the mudflat were estimated from aerial photographs of the LPR (GEOD 2007).

GIS – geographic information system

LPR – Lower Passaic River

LPRSA – Lower Passaic River Study Area

nd – no data

RM – river mile

3.1.2 Summary of LPRSA habitat and plant community observations

In the lower portions of the LPRSA, where most of the shoreline has been industrially developed, the plant community was less diverse and comprised mostly of scrub-shrub vegetation, such as groundsel tree, frequently intermixed with individual or small stands trees. In general, tree species present were representative of disturbed conditions and consisted primarily of tree-of-heaven (*Ailanthus altissima*), eastern cottonwood (*Populus deltoids*), Norway maple (*Acer platanoides*), locust trees (*Gleditsia* spp. or *Robinia* spp.), and catalpa (*Catalpa speciosa*). Sites dominated with emergent vegetation were primarily below RM 3.5 and were associated with intertidal mudflats. In general, these areas were dominated by smooth cordgrass (*Spartina alterniflora*) or common reed (*Phragmites australis*). Japanese knotweed (*Fallopia japonica*, syn. *Polygonum cuspidatum*) was also noted as a dominant emergent species in the lower portions of the river as well as throughout the remainder of the LPRSA.

Further upriver, where the shoreline was flanked by wider urban green spaces and parks, mixed forest became more dominant and diverse with the addition of elm (*Ulmus* spp.), sycamore (*Platanus* spp.), ash (*Fraxinus* spp.), and willow (*Salix* spp.) trees; the emergent plant community also included, among others, *Amaranthus* spp., purple loosestrife (*Lythrum salicaria*), and goldenrod (*Solidago* spp.). Although there were fewer sites with emergent vegetation upriver, a more mature canopy with overhanging vegetation and large woody debris was more prevalent along the shoreline. Above RM 16.5, to the Dundee Dam (at RM 17.4), is a large floodplain that consists mostly of silver maple.

Table 3-4 identifies the general plant communities encountered during the survey, as well as prominent habitat features at each river mile segment, where appropriate; these plant community designations are shown in Figure 3-2. Throughout the LPRSA, the plant community was generally mixed with both native and non-native plants and often dominated by a few species, in both the canopy and the understory. Table 3-5 identifies the more commonly observed plants and their native/non-native status.

Table 3-4. Plant communities and habitat features identified along the LPRSA

| RM Segment | Waypoint ID | Plant Community | Habitat Feature Notes |
|------------------------------|-------------|----------------------------------|---|
| Left Bank^a | | | |
| RM 0.0 – RM 1.4 | 69 – 72 | none | sparse vegetation; sparse large woody debris |
| RM 1.4 – RM 1.6 | 68 – 69 | emergent vegetation | |
| RM 1.6 – RM 1.8 | 67 – 68 | shrub/scrub | |
| RM 1.8 – RM 2.1 | 66 – 67 | emergent vegetation | large woody debris; rocks |
| RM 2.1 – RM 2.2 | 65 – 66 | shrub/scrub; emergent vegetation | sparse vegetation; large woody debris; rocks |
| RM 2.2 – RM 2.3 | 64 – 65 | shrub/scrub | sparse vegetation |
| RM 2.3 – RM 2.6 | 62 – 64 | emergent vegetation | mudflat area |
| RM 2.6 – RM 2.8 | 61 – 62 | shrub/scrub | |
| RM 2.8 – RM 3.5 | 54 – 61 | none | sparse vegetation on top of bulkhead |
| RM 3.5 – RM 4.4 | 50 – 54 | mixed forest; shrub/scrub | steep slope; small snags |
| RM 4.4 – RM 5.7 | 42 – 50 | none | sparse vegetation on top of bulkhead |
| RM 5.7 – RM 6.2 | 39 – 42 | mixed forest; shrub/scrub | snag; sparse vegetation on top of bulkhead |
| RM 6.2 – RM 6.3 | 38 – 39 | none | |
| RM 6.3 – RM 7.7 | 33 – 38 | mixed forest; shrub/scrub | snags; large woody debris; pilings |
| RM 7.7 – RM 7.9 | 31 – 33 | none | |
| RM 7.9 – RM 8.0 | 30 – 31 | shrub/scrub | |
| RM 8.0 – RM 8.5 | 27 – 30 | none | sparse vegetation growing out of bulkhead wall along Highway 21 |
| RM 8.5 – RM 8.6 | 26 – 27 | mixed forest; shrub/scrub | |
| RM 8.6 – RM 8.8 | 25 – 26 | shrub/scrub | sparse vegetation growing out of bulkhead wall along Highway 21 |
| RM 8.8 – RM 11.1 | 19 – 25 | mixed forest; shrub/scrub | snags; overhanging vegetation; large woody debris in water |
| RM 11.1 – RM 11.2 | 18 – 19 | shrub/scrub | snags |
| RM 11.2 – RM 11.4 | 16 – 18 | mixed forest | large woody debris; overhanging vegetation |
| RM 11.4 – RM 11.9 | 11 – 16 | mixed forest; shrub/scrub | snags; large woody debris |
| RM 11.9 – RM 12.1 | 10 – 11 | none | purple loosestrife growing out of outfall pipe |
| RM 12.1 – RM 13.4 | 4 – 10 | mixed forest; shrub/scrub | snags; overhanging vegetation; large woody debris in water |
| RM 13.4 | 3 – 4 | none | |
| RM 13.4 – RM 13.5 | 1 – 3 | scrub/shrub | |
| RM 13.5 – RM 13.6 | 97 – 98 | mixed forest | |
| RM 13.6 – RM 13.8 | 98 – 99 | mixed forest; shrub/scrub | snags; large woody debris |
| RM 13.8 – RM 13.9 | 99 – 100 | mixed forest | |

Table 3-4. Plant communities and habitat features identified along the LPRSA

| RM Segment | Waypoint ID | Plant Community | Habitat Feature Notes |
|-------------------------------|---------------------------|---|---|
| RM 13.9 | 100 – 101 | mixed forest; shrub/scrub | |
| RM 13.9 – RM 14.0 | 101 – 102 | mixed forest | snags |
| RM 14.0 – RM 14.2 | 102 – 103 | mixed forest; shrub/scrub | nursery trees abundant |
| RM 14.2 – RM 14.4 | 103 – 104 | mixed forest | |
| RM 14.4 – RM 14.7 | 104 – 106 | mixed forest; shrub/scrub | sparse trees; snags; overhanging vegetation |
| RM 14.7 – RM 14.8 | 106 – 107 | shrub/scrub | sparse trees |
| RM 14.8 – RM 16.2 | 107 – 114 | mixed forest; shrub/scrub | large woody debris; overhanging vegetation; snags |
| RM 16.2 – RM 16.5 | not assigned ^b | mixed forest; shrub/scrub ^c | |
| RM 16.5 – RM 16.7 | not assigned ^b | none | |
| RM 16.7 – RM 17.4 | not assigned ^b | mixed forest; shrub/scrub ^c | |
| Right Bank^d | | | |
| RM 0.0 – RM 0.4 | 73 – 74 | emergent vegetation | trees above shoreline; small areas (< 20 ft) of smooth cordgrass/common reed (<i>Spartina alterniflora/Phragmites australis</i>) |
| RM 0.4 – RM 1.9 | 74 – 76 | none | |
| RM 1.9 – RM 2.7 | 76 – 77 | shrub/scrub | small sections of bulkhead interspersed |
| RM 2.7 – RM 3.2 | 77 – 79 | none | sparse vegetation |
| RM 3.2 – RM 3.3 | 79 – 80 | emergent vegetation | |
| RM 3.3 – RM 3.4 | 80 – 81 | mixed forest; shrub/scrub | few trees; mostly shrub/scrub |
| RM 3.4 – RM 3.5 | 81 – 82 | mixed forest | |
| RM 3.5 – RM 3.9 | 82 – 83 | mixed forest; emergent vegetation | |
| RM 3.9 – RM 4.1 | 83 – 84 | mixed forest | rocky shoreline; snags; pilings |
| RM 4.1 – RM 4.4 | 84 – 85 | mixed forest; emergent vegetation | large woody debris; pilings |
| RM 4.4 – RM 5.4 | 85 – 88 | mixed forest; shrub/scrub | few trees |
| RM 5.4 – RM 6.2 | 88 – 89 | none | sparse vegetation |
| RM 6.2 – RM 6.4 | 89 – 90 | mixed forest; shrub/scrub | small sections of riprap |
| RM 6.4 – RM 6.7 | 90 – 92 | none | sparse vegetation |
| RM 6.7 – RM 8.5 | 92 – 96 | mixed forest; shrub/scrub | rocky shoreline; pilings; snags; large woody debris |
| RM 8.5 – RM 8.6 | 142 – 143 | mixed forest | tree density increases |
| RM 8.6 – RM 8.9 | 141 – 142 | emergent vegetation | |

Table 3-4. Plant communities and habitat features identified along the LPRSA

| RM Segment | Waypoint ID | Plant Community | Habitat Feature Notes |
|-------------------|---------------------------|---|---|
| RM 8.6 – RM 10.2 | 133 – 142 | mixed forest; shrub/scrub | large woody debris; snags; overhanging vegetation; wide patches of mudflat with some aquatic vegetation/common reed (<i>Phragmites australis</i>) under power lines |
| RM 9.6 | 137 | emergent vegetation | |
| RM 10.2 – RM 10.4 | 132 – 133 | none | |
| RM 10.4 – RM 10.6 | 131 – 132 | mixed forest; shrub/scrub | steep bank |
| RM 10.6 – RM 10.8 | 130 – 131 | emergent vegetation | overhanging vegetation; large woody debris; snags, large rocks; park area |
| RM 10.8 – RM 11.0 | 129 – 130 | none | |
| RM 11.0 – RM 12.1 | 127 – 129 | mixed forest; shrub/scrub | some riprap and bulkhead; overhanging vegetation; large woody debris; residential area |
| RM 12.1 – RM 12.3 | 125 – 127 | shrub/scrub | |
| RM 12.3 – RM 12.5 | 123 – 125 | mixed forest | |
| RM 12.5 – RM 13.2 | 122 – 123 | mixed forest; shrub/scrub | large woody debris; snags |
| RM 13.2 – RM 13.3 | 120 – 122 | mixed forest | |
| RM 13.3 – RM 13.4 | 119 – 120 | none | |
| RM 13.4 – RM 14.1 | 117 – 119 | mixed forest; shrub/scrub | abundant tree cover |
| RM 14.1 – RM 14.3 | 116 – 117 | none | |
| RM 14.3 – RM 15.6 | 115 – 116 | mixed forest; shrub/scrub | large woody debris; snags; abundant tree cover |
| RM 15.6 – RM 17.1 | not assigned ^b | mixed forest; shrub/scrub ^c | |
| RM 16.6 | 144 | mixed forest; shrub/scrub | cobble substrate; large woody debris |
| RM 17.1 – RM 17.2 | 145 – 146 | mixed forest; shrub/scrub | floodplain habitat below dam; large woody debris |
| RM 17.2 – RM 17.4 | not assigned ^b | mixed forest; shrub/scrub ^c | |

^a Left bank is the bank on the left of the river when facing upstream.

^b Waypoint ID was not assigned because area of shoreline could not be access by boat or on foot.

^c Plant community was determined by reviewing aerial photographs supplemented by satellite images.

^d Right bank is the bank on the right of the river when facing upstream.

ID – identification

LPRSA – Lower Passaic River Study Area

RM – river mile

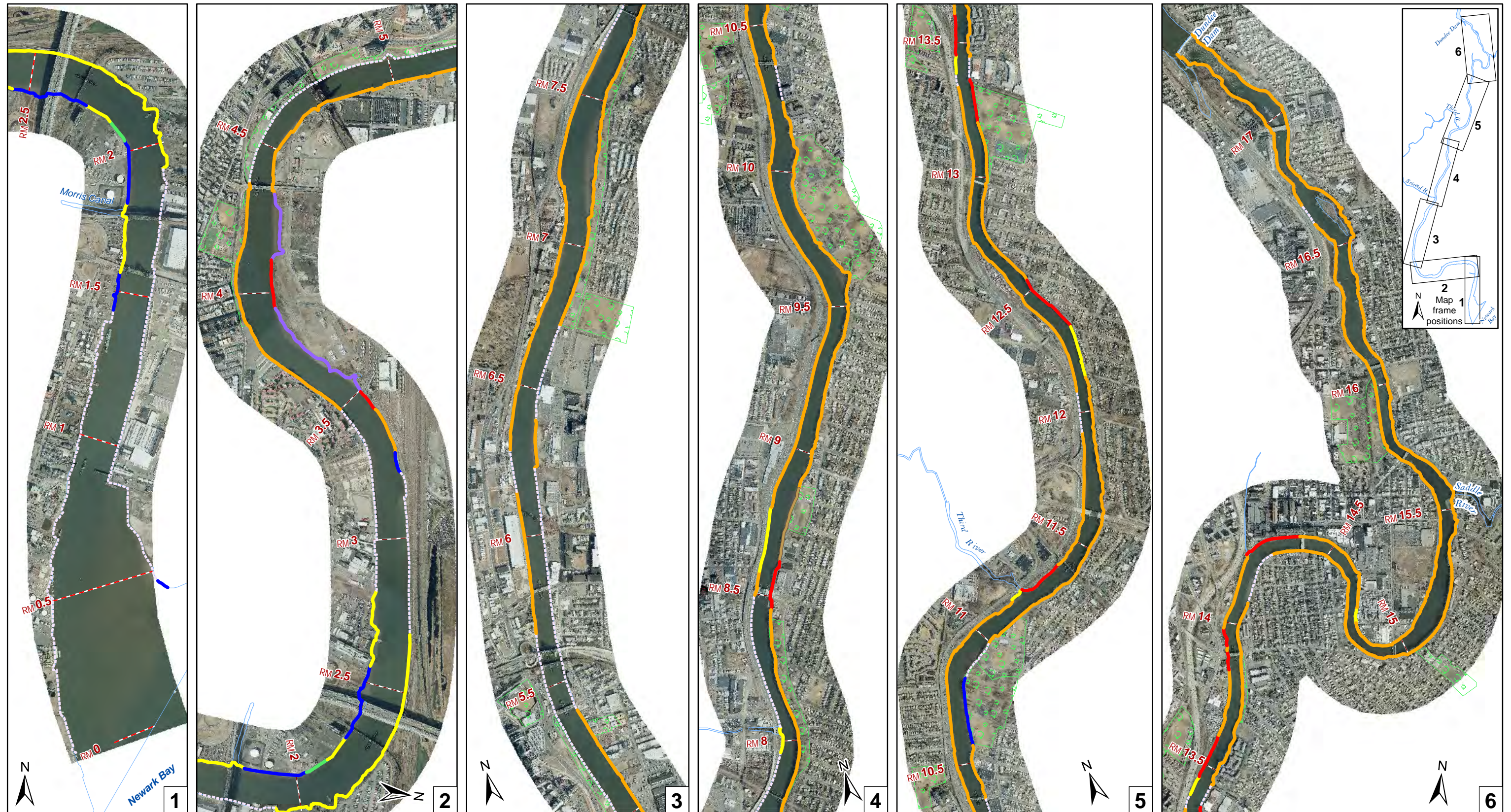


Figure 3-2. LPRSA shoreline plant communities

Table 3-5. Common plant species identified in the LPRSA

| Common Name | Scientific Name | Status ^a |
|-----------------------------|---|---|
| American elm | <i>Ulmus americana</i> | native |
| Aster (unidentified) | <i>Aster</i> spp. | |
| Black locust | <i>Robinia pseudoacacia</i> | native (naturalized from southeast United States) |
| Boneset (unidentified) | <i>Eupatorium</i> spp. | |
| Box elder | <i>Acer negundo</i> | native |
| Catalpa | <i>Catalpa speciosa</i> | native |
| Cattail (unidentified) | <i>Typha</i> spp. | |
| Common reed | <i>Phragmites australis</i> | native |
| Eastern cottonwood | <i>Populus deltoides</i> | native |
| Elm (unidentified) | <i>Ulmus</i> spp. | |
| Goldenrod (unidentified) | <i>Solidago</i> spp. | |
| Groundsel tree ^b | <i>Baccharis halimifolia</i> | native |
| Hickory (unidentified) | <i>Carya</i> spp. | |
| Honeysuckle (unidentified) | <i>Lonicera</i> spp. | |
| Horseweed (unidentified) | <i>Conyza</i> spp. | |
| Japanese knotweed | <i>Fallopia japonica</i> , syn. <i>Polygonum cuspidatum</i> | non-native |
| Jewelweed (unidentified) | <i>Impatiens</i> spp. | |
| Locust (unidentified) | <i>Gleditsia</i> spp. or <i>Robinia</i> spp. | |
| Maple (unidentified) | <i>Acer</i> spp. | |
| Mimosa (unidentified) | <i>Mimosa</i> spp. | |
| Mugwort (unidentified) | <i>Artemisia</i> spp. | |
| Mulberry ^b | <i>Morus</i> spp. | |
| Multiflora rose | <i>Rosa multiflora</i> | non-native |
| Northern red oak | <i>Quercus rubra</i> | native |
| Norway maple | <i>Acer platanoides</i> | non-native |
| Oak (unidentified) | <i>Quercus</i> spp. | |
| Pigweed/amaranth | <i>Amaranthus</i> spp. | |
| Poison ivy | <i>Toxicodendron radicans</i> | native |
| Pokeweed | <i>Phytolacca americana</i> | native |
| Princess tree | <i>Paulownia tomentosa</i> | non-native |
| Purple loosestrife | <i>Lythrum salicaria</i> | non-native |
| Ragweed (unidentified) | <i>Ambrosia</i> spp. | |
| Ragwort | <i>Jacobaea vulgaris</i> , syn. <i>Senecio jacobaea</i> | non-native |
| Red osier dogwood | <i>Cornus sericea</i> | native |
| Silk tree | <i>Albizia julibrissin</i> | non-native |
| Silver maple ^b | <i>Acer saccharinum</i> | native |
| Smooth cordgrass | <i>Spartina alterniflora</i> | native |

Table 3-5. Common plant species identified in the LPRSA

| Common Name | Scientific Name | Status ^a |
|--------------------------|------------------------------------|---------------------|
| Snakeroot (unidentified) | <i>Ageratina</i> spp. | |
| Sycamore | <i>Platanus occidentalis</i> | native |
| Tree-of-heaven | <i>Ailanthus altissima</i> | non-native |
| Virginia creeper | <i>Parthenocissus quinquefolia</i> | native |
| Weeping willow | <i>Salix babylonica</i> | non-native |
| White ash | <i>Fraxinus americana</i> | native |
| Willow (unidentified) | <i>Salix</i> spp. | |

^a Native/non-native status is provided only for plants identified to the species level, when available (NRCS 2010).

^b Species identified by USEPA oversight personnel.

3.1.3 Summary of wildlife observations along the LPRSA

Most of the wildlife that was incidentally observed along the mainstem of the LPRSA during the survey was birds (including gulls [*Laurus* spp.], egrets and herons [*Ardea* spp.], mallard ducks [*Anas platyrhynchos*], Canada geese [*Branta canadensis*], double-crested cormorants [*Phalacrocorax auritus*], and belted kingfishers [*Megasceryle alcyon*]); but one reptile (i.e., turtle [unidentified species]) and a few mammals (i.e., groundhogs [*Marmota monax*] and a Norway rat [*Rattus norvegicus*]) were also sighted. Table 3-6 presents the wildlife observed during the habitat identification survey. Although wildlife were incidentally observed during the habitat survey (as documented herein), these observations do not represent a comprehensive survey. Comprehensive seasonal avian surveys are being conducted in the LPRSA, and the results of these surveys will be presented in subsequent data reports.

Table 3-6. Wildlife observations along the LPRSA

| RM Segment | Waypoint ID | Wildlife Observed | |
|------------------------------|-------------|---------------------------|------------------------------|
| | | Common Name | Scientific Name |
| Left Bank^a | | | |
| RM 1.2 – RM 1.4 | 70 – 71 | unidentified gull species | <i>Laurus</i> spp. |
| RM 1.8 – RM 2.2 | 65 – 67 | great egret | <i>Ardea alba</i> |
| RM 2.1 – RM 2.3 | 64 – 66 | unidentified gull species | <i>Laurus</i> spp. |
| | | mallard duck | <i>Anas platyrhynchos</i> |
| RM 2.6 – RM 2.8 | 61 – 62 | unidentified gull species | <i>Laurus</i> spp. |
| RM 6.6 – RM 7.0 | 36 – 37 | unidentified gull species | <i>Laurus</i> spp. |
| RM 7.3 – RM 7.6 | 33 – 34 | unidentified gull species | <i>Laurus</i> spp. |
| | | double-crested cormorant | <i>Phalacrocorax auritus</i> |
| | | great blue heron | <i>Ardea herodias</i> |
| RM 8.8 – RM 10.0 | 24 – 25 | unidentified gull species | <i>Laurus</i> spp. |
| | | red-winged blackbird | <i>Agelaius phoeniceus</i> |
| | | rock pigeon | <i>Columba livia</i> |

Table 3-6. Wildlife observations along the LPRSA

| RM Segment | Waypoint ID | Wildlife Observed | |
|-------------------------|-------------|------------------------------|---|
| | | Common Name | Scientific Name |
| | | barn swallow | <i>Hirundo rustica</i> |
| RM 10.4 – RM 11.1 | 20 – 21 | unidentified turtle species | unknown |
| | | great blue heron | <i>Ardea herodias</i> |
| | | belted kingfisher | <i>Megaceryle alcyon</i> |
| RM 11.2 – RM 11.3 | 17 – 18 | rock pigeon | <i>Columba livia</i> |
| | | belted kingfisher | <i>Megaceryle alcyon</i> |
| RM 11.4 – RM 11.5 | 13 – 14 | great blue heron | <i>Ardea herodias</i> |
| | | belted kingfisher | <i>Megaceryle alcyon</i> |
| RM 14.4 – RM 14.7 | 105 – 106 | great blue heron | <i>Ardea herodias</i> |
| RM 14.8 – RM 16.1 | 109 – 113 | great blue heron | <i>Ardea herodias</i> |
| | | rock pigeon | <i>Columba livia</i> |
| | | barn swallow | <i>Hirundo rustica</i> |
| Right Bank ^b | | | |
| RM 0.3 – RM 0.4 | 73 – 74 | unidentified gull species | <i>Laurus</i> spp. |
| | | Canada goose | <i>Branta canadensis</i> |
| RM 1.9 – RM 2.7 | 76 – 77 | double-crested cormorant | <i>Phalacrocorax auritus</i> |
| RM 3.4 – RM 3.5 | 81 – 82 | belted kingfisher | <i>Megaceryle alcyon</i> |
| RM 3.5 – RM 3.9 | 82 – 83 | great blue heron | <i>Ardea herodias</i> |
| | | mallard duck | <i>Anas platyrhynchos</i> |
| RM 4.2 – RM 4.3 | 84 – 85 | unidentified gull species | <i>Laurus</i> spp. |
| RM 4.4 – RM 4.6 | 86 – 87 | unidentified gull species | <i>Laurus</i> spp. |
| RM 6.3 – RM 6.4 | 89 – 90 | great blue heron | <i>Ardea herodias</i> |
| RM 6.7 – RM 7.1 | 92 – 93 | groundhog | <i>Marmota monax</i> |
| RM 8.9 – RM 9.6 | 137 – 141 | Norway rat | <i>Rattus norvegicus</i> |
| | | mallard duck | <i>Anas platyrhynchos</i> |
| RM 9.8 – RM 10.1 | 134 – 135 | belted kingfisher | <i>Megaceryle alcyon</i> |
| | | great egret | <i>Ardea alba</i> |
| RM 10.8 – RM 11.0 | 129 – 130 | Canada goose | <i>Branta canadensis</i> |
| RM 13.3 | 120 – 121 | American robin | <i>Turdus migratorius</i> |
| RM 14.3 – RM 15.6 | 115 – 116 | mallard duck | <i>Anas platyrhynchos</i> |
| | | mourning dove | <i>Zenaida macroura</i> |
| | | unidentified warbler species | <i>Dendroica</i> spp. or <i>Wilsonia</i> spp. |
| | | belted kingfisher | <i>Megaceryle alcyon</i> |
| | | groundhog | <i>Marmota monax</i> |
| RM 14.1 – RM 14.3 | 116 – 117 | great blue heron | <i>Ardea herodias</i> |
| | | unidentified gull species | <i>Laurus</i> spp. |
| | | Canada goose | <i>Branta canadensis</i> |
| RM 16.6 | 144 | Canada goose | <i>Branta canadensis</i> |

Table 3-6. Wildlife observations along the LPRSA

| RM Segment | Waypoint ID | Wildlife Observed | |
|------------|-------------|-------------------|---------------------------|
| | | Common Name | Scientific Name |
| RM 17.2 | 146 | Canada goose | <i>Branta canadensis</i> |
| | | mallard duck | <i>Anas platyrhynchos</i> |
| | | great egret | <i>Ardea alba</i> |

^a Left bank is the bank on the left of the river when facing upstream.

^b Right bank is the bank on the right of the river when facing upstream.

LPRSA – Lower Passaic River Study Area

RM – river mile

3.1.4 Summary of observations related to human access and shoreline features along the mainstem of the LPRSA

During the habitat identification survey that was conducted from September 20 to 22, 2010, information related to shoreline features, public access points (e.g., boat launches/docks, worn foot paths), and observed human uses of the LPRSA was compiled by AECOM staff. Observations along the mainstem of the LPRSA were conducted via boat on September 20 and 21. Parks and public open space along the right shore were observed from land on September 22. This section summarizes the observations related to shoreline type, predominant adjoining land uses, human uses and activities recorded during the survey (e.g., fishing, rowing), and relevant shoreline features, including boat launches, boat docks, marinas, homeless/transient camps, fencing, and worn footpaths along the mainstem of the LPRSA. Table 3-7 presents a summary of AECOM's observations by river mile and survey waypoint. This section, as well as field forms completed during the survey (presented in Appendix A), a series of figures that identify the adjoining land use, shoreline type, and features related to human access and use (presented as Appendix D), and a photo log (presented as Appendix E), were provided by AECOM.

Table 3-7. Summary of observations of LPRSA shoreline features and uses

| River Mile | Waypoint ID | Shoreline Type | Shoreline Features and Use Notes |
|------------------------------|-------------|---------------------|--|
| Left Bank^a | | | |
| 0 – 1.2 | 71 – 72 | sheet pile/bulkhead | Photos 1, 2, and 3 Passaic Valley Sewerage Commission dock at RM 0.2 (Photo 1) boat dock at RM 0.6 (Photo 3) land use is industrial/commercial/urban |
| 1.2 – 1.4 | 70 – 71 | riprap/stone | land use is industrial/commercial/urban |
| 1.4 | 69 – 70 | sheet pile/bulkhead | land use is industrial/commercial/urban |
| 1.5 | 66 – 68 | natural/vegetated | Photo 4 land use is industrial/commercial/urban |
| 1.5 | 68 – 69 | riprap/stone | land use is industrial/commercial/urban |
| 2.03 – 2.3 | 64 – 66 | sheet pile/bulkhead | land use is industrial/commercial/urban |
| 2.3 – 2.8 | 61 – 64 | natural/vegetated | Photos 5, 6, and 7 land use is industrial/commercial/urban |
| 2.8 – 3.3 | 57 – 61 | sheet pile/bulkhead | Photos 8 and 9 land use is industrial/commercial/urban |
| 3.3 – 3.4 | 56 – 57 | riprap/stone | land use is industrial/commercial/urban |
| 3.4 – 3.5 | 54 – 56 | sheet pile/bulkhead | Photo 10 land use is industrial/commercial/urban |
| 3.5 – 3.7 | 53 – 54 | riprap/stone | land use is industrial/commercial/urban |
| 3.7 – 3.8 | 52 – 53 | sheet pile/bulkhead | land use is industrial/commercial/urban |
| 3.8 – 4.4 | 50 – 52 | natural/vegetated | Riverbank Park, Newark, New Jersey homeless camp at RM 4.2 (Photo 11) land use is recreational/open space |
| 4.4 – 7.2 | 35 – 50 | sheet pile/bulkhead | Photos 12 through 20 private boat dock and marina at RM 7.1 (Photo 20) Minish Park at RM 4.5 to RM 5.1 (Photos 12, 13, and 14) land use is industrial/commercial/urban and recreational/open space bounded by infrastructure (Route 21) |
| 7.2 | 34 – 35 | natural/vegetated | land use is fringe of vegetated open space bounded by infrastructure (Route 21) |

Table 3-7. Summary of observations of LPRSA shoreline features and uses

| River Mile | Waypoint ID | Shoreline Type | Shoreline Features and Use Notes |
|-------------|-------------|---------------------|---|
| 7.2 – 8.0 | 31 – 34 | sheet pile/bulkhead | Photo 21 land use is infrastructure (Route 21) |
| 8.0 | 30 – 31 | natural/vegetated | confluence with Second River |
| 8.0 – 8.5 | 27 – 30 | sheet pile/bulkhead | land use is infrastructure (Route 21) |
| 8.5 | 26 – 27 | natural/vegetated | land use is fringe of vegetation bounded by infrastructure (Route 21) |
| 8.5 – 10 | 24 – 26 | sheet pile/bulkhead | Photos 22 through 25 land use is fringe of vegetation bounded by infrastructure (Route 21) |
| 10.0 – 10.2 | 23 – 24 | natural/vegetated | land use is open space bounded by infrastructure (Route 21) |
| 10.2 – 11.2 | 20 – 23 | sheet pile/bulkhead | Photos 26 and 27 Nutley boat ramp at RM 10.5 (Photo 27) homeless camp at RM 10.4 (Photo 26) |
| 11.1 | 19 – 20 | natural/vegetated | land use is open space bounded by infrastructure (Route 21) |
| 11.2 | 18 – 19 | sheet pile/bulkhead | confluence with Third River |
| 11.2 – 11.5 | 13 – 18 | natural/vegetated | land use is open space bounded by infrastructure (Route 21) |
| 11.5 – 12.2 | 9 – 13 | sheet pile/bulkhead | Photos 28 and 29 land use is fringe of vegetation with some open space bounded by infrastructure (Route 21) |
| 12.2 – 12.7 | 8 – 9 | riprap/stone | private boat launch at RM 12.5 (Photo 30) land use is industrial/commercial/urban and open space bounded by infrastructure (Route 21) |
| 12.7 – 12.9 | 7 – 8 | sheet pile/bulkhead | Photos 31 and 32 fishing observed at RM 12.8 (Photo 32) land use is fringe of vegetation bounded by infrastructure (Route 21) |
| 12.9 – 13.1 | 5 – 7 | natural/vegetated | land use is open space bounded by infrastructure (Route 21) path through vegetation to shore observed just upstream of Union Avenue bridge sculler observed on river just below Union Avenue bridge |
| 13.1 – 13.4 | 1 – 5 | sheet pile/bulkhead | land use is fringe of vegetation bounded by infrastructure (Route 21) |
| 13.4 – 13.6 | 97 – 98 | natural/vegetated | land use is open space and industrial/commercial/urban bounded by infrastructure (Route 21) |
| 13.6 – 13.8 | 98 – 99 | sheet pile/bulkhead | land use is industrial/commercial/urban |
| 13.8 – 13.9 | 99 – 100 | natural/vegetated | land use is industrial/commercial/urban |
| 13.9 | 100 – 101 | sheet pile/bulkhead | land use is industrial/commercial/urban |

Table 3-7. Summary of observations of LPRSA shoreline features and uses

| River Mile | Waypoint ID | Shoreline Type | Shoreline Features and Use Notes |
|-------------------------------|-------------|---------------------|---|
| 13.9 – 14.0 | 101 – 102 | natural/vegetated | Photo 33 land use is industrial/commercial/urban |
| 14.0 – 14.4 | 102 – 105 | sheet pile/bulkhead | Photos 34 through 36 homeless camp under Dundee Canal bridge at RM 14.2 (Photo 35) land use is industrial/commercial/urban bounded by infrastructure (Route 21) |
| 14.4 – 14.8 | 105 – 106 | natural/vegetated | Photo 37 land use is industrial/commercial/urban |
| 14.8 | 106 – 107 | sheet pile/bulkhead | Photo 38 land use is industrial/commercial/urban |
| 14.8 | 107 – 108 | natural/vegetated | land use is industrial/commercial/urban |
| 14.9 | 108 – 109 | sheet pile/bulkhead | Photo 39 land use is industrial/commercial/urban |
| 14.9 – 16.1 | 109 – 113 | natural/vegetated | Photos 40 through 43 Pulaski Park at RM 15.7 to RM 16 (Photo 43) Pulaski Park boat ramp at RM 15.9 (Photo 42) private boat launch at RM 15.5 (Photo 41) boat launch at RM 15.4 (Photo 40) land use is residential, recreational, and industrial/commercial/urban space |
| 16.1 – 16.2 | 113 – 114 | sheet pile/bulkhead | Photos 44 through 46 small area past bulkhead in park where shoreline is accessible (Photo 46) land use is residential and recreational |
| 16.2 – 17.4 | on foot | natural/vegetated | homeless camp at RM 17 land use is open space and industrial/commercial/urban bounded by infrastructure (Route 21) |
| Right Bank^b | | | |
| 0.4 | 73 – 74 | natural/vegetated | access to river bank at Kearny Point (Photo 49) land use is open space and industrial/commercial/urban |
| 0.4 – 0.9 | 74 – 75 | riprap/stone | land use is industrial/commercial/urban |
| 0.9 – 1.9 | 75 – 76 | sheet pile/bulkhead | Photo 50 land use is industrial/commercial/urban with some infrastructure |

Table 3-7. Summary of observations of LPRSA shoreline features and uses

| River Mile | Waypoint ID | Shoreline Type | Shoreline Features and Use Notes |
|------------|-------------|---------------------|--|
| 1.9 – 2.7 | 76 – 77 | riprap/stone | Photos 51 through 53 old boat dock at RM 2.2 (Photo 52) steps to water's edge beside bridge at RM 2.3 (Photo 53) land use is infrastructure (train tracks) with some open space |
| 2.7 – 3.1 | 77 – 78 | sheet pile/bulkhead | land use is infrastructure (train tracks) |
| 3.1 – 3.5 | 78 – 82 | natural/vegetated | land use is infrastructure (train tracks) |
| 3.5 – 4.4 | 82 – 85 | natural/vegetated | Photos 54 and 55 land use is industrial/commercial/urban with some open space |
| 4.4 – 6.2 | 85 – 89 | sheet pile/bulkhead | Photos 56 through 59 land use is industrial/commercial/urban |
| 6.2 – 6.4 | 89 – 90 | natural/vegetated | land use is industrial/commercial/urban |
| 6.4 – 6.6 | 90 – 91 | riprap/stone | Photos 60 and 61 land use is industrial/commercial/urban; no trespassing sign |
| 6.6 – 6.7 | 91 – 92 | sheet pile/bulkhead | Photo 62 land use is industrial/commercial/urban |
| 6.7 – 8.5 | 92 – 96 | natural/vegetated | Photos 63 through 68 Kearny Park at RM 6.7 to RM 6.8 Riverbank Park, Kearny at RM 6.8 to RM 8.5 Kearny boat launch at RM 6.8 (Photo 63) Rapp's Boat Yard at RM 7.7 (Photo 65) Kearny High School floating dock at RM 8.5 (Photo 67) access to river bank through park; no fence land use is recreational/open space with some industrial/commercial/urban space |

Table 3-7. Summary of observations of LPRSA shoreline features and uses

| River Mile | Waypoint ID | Shoreline Type | Shoreline Features and Use Notes |
|-------------|-------------|---------------------|--|
| 8.5 – 10.2 | 133 – 143 | natural/vegetated | <p>Photos 69 through 79</p> <p>Riverside County Park at RM 9.6 to RM 10.1</p> <p>Passaic River Rowing Association floating dock at RM 9.9 (Photo 79)</p> <p>Passaic Valley Sewer Commission private boat launch at RM 9.5 (Photo 74)</p> <p>private boat docks at RM 9.0 (man observed working on dock) (Photo 70) and RM 9.2</p> <p>fishing observed at RM 9.1 (Photos 71 and 72) next to firehouse boat launch</p> <p>baseball field at RM 8.7 to RM 8.9 (Photo 69)</p> <p>Riverbank Park, Kearny at RM 8.4 to RM 8.5</p> <p>access to river bank through parkland at various locations</p> <p>land use is residential, recreational and industrial/commercial/urban</p> |
| 10.2 – 10.3 | 132 – 133 | bulkhead | <p>Photo 80</p> <p>land use is residential</p> |
| 10.3 – 10.5 | 131 – 132 | natural/vegetated | land use is residential, and industrial/commercial/urban |
| 10.5 – 10.9 | 130 – 131 | natural/vegetated | <p>Photos 81 and 82</p> <p>Riverside County Park at RM 10.5 to RM 10.9</p> <p>access to river bank through parkland</p> <p>land use is recreational</p> |
| 10.9 – 12.1 | 127 – 130 | natural/vegetated | <p>Photos 83 through 87</p> <p>Lyndt Park at RM 10.9 to RM 11.7</p> <p>boat launch at RM 11.0 (Photo 83)</p> <p>Montclair College boathouse and dock at RM 11.6 ; rowers observed boarding boats (Photo 84)</p> <p>land use is recreational/open space with some residential and industrial/commercial/urban space</p> |
| 12.1 | 126 – 127 | sheet pile/bulkhead | <p>Photo 88</p> <p>Nereid Boat Club at RM 12.1 (Photo 88)</p> <p>land use is recreational/open space</p> |
| 12.1 – 13.2 | 122 – 125 | natural/vegetated | <p>Photos 89 through 93</p> <p>land use is recreational/open space (Rutherford Memorial Park) and residential</p> |

Table 3-7. Summary of observations of LPRSA shoreline features and uses

| River Mile | Waypoint ID | Shoreline Type | Shoreline Features and Use Notes |
|-------------|-------------|---------------------|--|
| 13.2 – 13.4 | 121 – 122 | sheet pile/bulkhead | Photo 94 Rutherford Memorial Park at RM 13.2 to RM 13.4 no access to water through Rutherford Memorial Park because of heavy tree line, steep embankment, and fencing land use is recreational/open space |
| 13.4 | 120 – 121 | natural/vegetated | land use is industrial/commercial/urban |
| 13.4 – 13.5 | 119 – 120 | sheet pile/bulkhead | CPG dock at RM 13.4 (Photo 95) |
| 13.5 – 14 | 118 – 119 | natural/vegetated | Memorial Park at RM 13.7 to RM 13.9 no access to water through Memorial Park because of dense shrubs and fencing (Photo 96) land use is residential and recreational/open space |
| 14 – 14.3 | 116 – 118 | sheet pile/bulkhead | Photos 97 through 99 boat ramp at RM 14.3 (Photo 98) land use is primarily residential with some commercial/industrial/urban space |
| 14.3 – 16.2 | 114 – 116 | natural/vegetated | Photos 100 through 104 path to river bank at RM 15.6 and RM 15.8 fishing observed at RM 15.1 boat ramp at RM 14.6 (Photo 101) foot path to river bank at RM 14.5 (Photo 100) and at RM 15.6 (Photo 104) land use is industrial/commercial/urban, residential, with some infrastructure and open space |
| 16.2 – 17.4 | on foot | natural/vegetated | Photos 47 and 48 fishing observed at RM 17 land use is industrial/commercial/urban, residential and open space |

^a Left bank is the bank on the left of the river when facing upstream

^b Right bank is the bank on the right of the river when facing upstream

CPG – Cooperating Parties Group

LPRSA – Lower Passaic River Study Area

RM – river mile

Shoreline types and potential access points were identified by AECOM based on field observations, videotape, and photo documentation. Shoreline type was categorized according to features relevant to the potential for human access and exposure (Figure D-1 in Appendix D). As described in Section 2.2.1, three predominant shoreline types were noted: natural/vegetated, riprap/stone, and sheet pile/bulkhead. For human access and exposure, areas of mixed vegetation overhanging bulkhead were classified as bulkhead, and areas of mixed vegetation overhanging riprap were classified as riprap. These classifications differ slightly from those used in the ecological habitat characterization, which classified shoreline with bulkhead or riprap with at least 50% overhanging vegetation as mixed vegetation. Differences in classification resulting from the two methods occurred along the left bank between RM 13 and RM 10 adjacent to Route 21, where vegetation was overhanging bulkhead, and one stretch of riprap along the right bank between RM 2.7 and 1.9.

Adjoining land use type shown in Figure D-1 was estimated based on the NJDEP GIS databank (2010). The following six land use categories were used based on NJDEP's land use categories: industrial/commercial/urban⁵, residential, recreational/open space, infrastructure, wetlands, and water.

For the purpose of presenting the habitat identification survey findings, the LPRSA has been preliminarily divided into four segments: RM 0 to RM 6.7 (left and right banks), RM 6.7 to RM 16.2 (left bank), RM 6.7 to RM 16.2 (right bank), and RM 16.2 to RM 17.4 (left and right banks). These segments are based on predominant shoreline features and adjoining land uses and are subject to further refinement pending the collection of any new data.

RM 0 to RM 6.7 (left and right banks)

RM 0 to RM 6.7 is dominated by industrial/commercial/urban land use as well as infrastructure (e.g., train tracks adjacent to the right bank from RM 2.0 to RM 3.5). The shoreline is predominantly composed of sheet pile and bulkhead with short segments of riprap/stone and natural, vegetated shoreline. For the most part, direct human access to the river is limited in this portion of the LPRSA because of the nature of the shoreline (i.e., vertical bulkhead) and industrial land uses adjacent to the river. Photos 1 to 19 show RM 0 to RM 6.7 on the left bank; Photos 49 to 61 show RM 0 to RM 6.7 on the right bank.

Major observations along the lower 6.7 miles are summarized as follows:

- ◆ The lower left bank up to approximately RM 1.5 is dominated by commercial marine vessel berths and docking facilities (Photos 1 through 4). Adjacent land use is industrial/marine and includes transportation and storage for the

⁵ NJDEP land use categories classified as industrial/commercial/urban include: commercial/services, industrial, industrial/commercial complexes, mixed urban or built-up land, other urban or built-up land.

petroleum industry. The shoreline in this area is predominantly sheet pile/bulkhead. The Passaic Valley Sewerage Commission dock is located in this stretch (Photo 1).

- ◆ The right bank near the confluence with Newark Bay is predominantly vacant land and open space (Kearny Point). The shoreline in this area is natural/vegetated and riprap/stone (Photo 49).
- ◆ A mix of infrastructure (e.g., bridges, rail), industrial and commercial facilities and vacant industrial/commercial land is present on both sides of the river up to approximately RM 3.9 on the left bank (Photos 6 through 10) and approximately RM 5 on the right bank (Photos 50 through 55).
- ◆ A small makeshift homeless camp was observed on the left bank at RM 4.2 (Photo 11).
- ◆ Riverbank Park, Newark (left bank), a narrow band of green space/open space, runs along the left bank from approximately RM 3.9 to RM 4.4. The shoreline bordering the park is vegetated and steeply sloped. Upstream of Riverbank Park, adjacent to City of Newark and Route 21, the shoreline is predominantly bulkhead (Photos 12 through 19).
- ◆ Along the right bank between RM 5 and RM 6.7, the adjacent land use is commercial (e.g., hotel, shopping, car wash) with a new development of multi-family condominiums (Photos 56 through 62). The shoreline is predominantly bulkhead and riprap. In many places, fencing separates the river from the adjoining onshore properties (e.g., Hampton Inn, condominiums).

RM 6.7 to RM 16.2 (left bank)

On the left bank between RM 6.7 to RM 16.2, land use is predominantly infrastructure (Route 21) and commercial/industrial, with pockets of recreational and residential land, particularly in the upper stretch of this segment. A narrow band of vegetated land between Route 21 and the river is present along parts of this stretch. The shoreline is predominantly sheet pile/bulkhead, with short segments of riprap/stone and vegetated shoreline (Photo 29). For the most part, direct human access to the river in this stretch is limited by the presence of Route 21 and the bulkhead along the shoreline. Photos 20 through 46 show RM 6.7 to RM 16.2 on the left bank.

Major observations along the left bank of RM 6.7 to RM 16.2 are summarized as follows:

- ◆ A private marina and boat launch is located at RM 7.1 (Photo 20).
- ◆ There is a small, makeshift homeless camp at RM 10.4 (Photo 26). At the time of the survey, a tent was present at this location.
- ◆ The Nutley Boat Ramp is located at RM 10.5 (Photo 27).

- ◆ A private boat launch along a riprap shoreline was observed at RM 12.5 (Photo 30).
- ◆ At the time of the survey, anglers with lines in the water were observed fishing from the top of a sheetpile bulkhead at RM 12.8 (Photo 32).
- ◆ A small, makeshift homeless camp is situated under the Dundee Canal Bridge at RM 14.2 (Photo 35).
- ◆ Several boat launches were observed between RM 15.4 and RM 15.9 (Photos 40 through 42). Some of these are private and abut residential properties.
- ◆ Pulaski Park runs along the left bank from RM 15.7 to RM 16.0 (Photos 42 and 43). Potential human access points were observed along the natural/vegetated shoreline of the park, including the Pulaski Park boat launch at RM 15.9 (Photo 42).
- ◆ Parks and multi-family residential areas continue along the left bank from approximately RM 16.1 to RM 16.2. Most of the shoreline is bulkheaded (Photos 44 through 46); a wooded area at the upper end of the park land slopes to the shoreline (Photo 46).

RM 6.7 to RM 16.2 (right bank)

On the right bank between RM 6.7 and RM 16.2, land use along the river is varied and includes recreational and green space, commercial, and residential areas. Several parks are located along the right bank between RM 6.7 to RM 13.4. The shoreline is dominated by vegetation, often growing over armored banks, with stretches of bulkhead and riprap. Photos 62 through 104 show RM 6.7 to RM 16.2 on the right bank.

Major observations along the right bank between RM 6.7 to RM 16.2 are summarized as follows:

- ◆ Kearny Park runs adjacent to the shore from RM 6.7 to RM 6.8. The Kearny Boat Launch is located at RM 6.8 (Photo 63).
- ◆ Riverbank Park (Kearny) runs adjacent to the shore almost continuously from approximately RM 6.8 to RM 8.5 (Photos 64, 66, and 68). Access to the river bank is possible through clearings and within areas where vegetation growth is limited. An expanse of exposed sediment/mudflat was observed offshore.
- ◆ Rapp's Boat Yard and Marina is located at RM 7.7 (Photo 65).
- ◆ The Kearny High School crew floating dock is located at RM 8.5 (Photo 67).
- ◆ A small park with a baseball field is located at approximately RM 8.7 to RM 8.8. Access to the river bank appears possible from this park, although the baseball field is fenced (Photo 69).

- ◆ Several boat docks and boat launches are located between RM 9 and RM 9.5 (Photos 70 and 71). The Passaic Valley Sewer Commission boat launch is located at RM 9.5 (Photo 74).
- ◆ The firehouse boat launch is at RM 9.1 next to a small park (Photos 72 and 73). At the time of the survey, one or more anglers were observed fishing at the park next to the boat launch (Photo 71).
- ◆ Riverside County Park is located adjacent to the river between RM 9.6 and RM 10.1 (Photos 75 through 79). Access to the river bank through clearings in the vegetation appears possible at several points in the park. An expanse of exposed sediment/mudflat was observed offshore.
- ◆ The Passaic River Rowing Association has a floating dock within Riverside County Park at RM 9.9 (Photo 79).
- ◆ Riverside County Park continues from RM 10.5 to RM 10.9 (Photos 81 and 82). Access to the river bank through clearings in the vegetation appears possible at several points in the park. An expanse of exposed sediment/mudflat was observed offshore.
- ◆ Lyndt Park is located between RM 10.9 and RM 11.7. A boat launch is located within the park at RM 11 (Photo 83). The shoreline is mostly vegetated.
- ◆ The Montclair College boathouse and dock is located at RM 11.6 (Photo 84). At the time of the survey, rowers were observed on the dock.
- ◆ A stretch of predominantly residential property is located between Lyndt Park and the southern end of Rutherford Memorial Park (approximately RM 11.7 to RM 12.8). Some of the properties have boat docks/ramps with access to the water; others are fenced and bulkheaded (Photos 85, 86, 87, 89, 90, 91, 92, and 93).
- ◆ The Nereid Boat Club and floating dock is located at RM 12.1 (Photo 88).
- ◆ Rutherford Memorial Park is located adjacent to the river between approximately RM 12.8 and RM 13.4. The park is fenced, and much of the shoreline is bulkheaded (Photo 94).
- ◆ The CPG dock is located at RM 13.4 (Photo 95).
- ◆ A small park (Memorial Park) is located next to the river at approximately RM 13.8. The park is fenced (Photo 96).
- ◆ Residential properties are located between RM 14 and RM 14.3 (Photos 97, 98, and 99). The properties are fenced along the shoreline, which is bulkheaded.
- ◆ A boat ramp is located at RM 14.3 (Photo 98).
- ◆ Between RM 14.5 and RM 14.6, there is a foot path to the water and a boat ramp (Photos 100 and 101).

- ◆ Park land/ green space is located between RM 15 and RM 15.6 and foot paths to the water's edge were observed (Photos 103 and 104). At the time of the survey, an angler was observed with a line in the water at RM 15.1. Residential property with access to the water is located at approximately RM 15.2 (Photo 102).

RM 16.2 to RM 17.4 (left and right banks)

This section of the river was only accessible by foot during the survey. Observations of this portion of the river were only made from the right bank. The shoreline is vegetated and slopes down to the water on both sides of the river (Photos 47 and 48). Makeshift homeless camps are present on both banks of the river at approximately RM 17. At the time of the survey, people were present at both locations. Two anglers were observed fishing off the right bank at approximately RM 17. Access to the water is possible throughout much of this stretch of the river, and several foot paths were observed.

3.2 SURVEY OF THE LPRSA TRIBUTARIES

This section presents the observations recorded on September 22 and 23, 2010, during the survey of the tributary locations. Supporting documentation (i.e., field forms and field logbook entries) and video footage are provided in Appendices A through C.

3.2.1 Summary of tributary shoreline characterization

The shoreline at 15 of the 18 tributary locations surveyed was characterized as mixed vegetation; the remaining three locations were characterized as bulkhead (Table 3-8).

Table 3-8. Shoreline types along the LPRSA tributaries surveyed

| Tributary | Location | Shoreline Category |
|------------------|------------------------|---------------------------|
| Saddle river | Arcola Pool Site | mixed vegetation |
| | County Park | mixed vegetation |
| | Felician College South | mixed vegetation |
| | Lodi Cemeteries | mixed vegetation |
| | Ox Bow | mixed vegetation |
| Second River | Belleville | bulkhead/mixed vegetation |
| | Bloomfield | bulkhead/mixed vegetation |
| | Mills | bulkhead/mixed vegetation |
| | Passaic | bulkhead/mixed vegetation |
| | Watsessing Park | bulkhead/mixed vegetation |
| | Wigwam Brook | bulkhead |

Table 3-8. Shoreline types along the LPRSA tributaries surveyed

| Tributary | Location | Shoreline Category |
|-------------|--------------------------|---------------------------|
| Third river | Bonsal Wildlife Preserve | mixed vegetation |
| | Clarks Pond | mixed vegetation |
| | Clifton Pond | mixed vegetation |
| | Forest Hills Field Club | mixed vegetation |
| | Glen Ridge Country Club | mixed vegetation |
| | JFK Parkway | bulkhead/mixed vegetation |
| | River Mouth | mixed vegetation |

3.2.2 Summary of tributary habitat and plant community observations

The plant communities at all but one of the tributary locations were composed of mixed forest with shrub/scrub (Table 3-9). The Arcola Pool site along the Saddle River was dominated by emergent vegetation. Plant species were similar to those found along the LPRSA. Plants commonly observed during the tributary survey, as well as their status as native/non-native species, are provided in Table 3-10.

Table 3-9. Plant community and habitat features along the tributary survey locations

| Tributary | Location | Plant Community | Habitat Features |
|--------------|------------------------|---------------------------|--|
| Saddle River | Arcola Pool Site | emergent vegetation | sand substrate; large patches of common reed (<i>Phragmites australis</i>); in-water concrete structures; large tree canopy along site border |
| | County Park | mixed forest; shrub/scrub | silt and sand substrate; cobbles; large woody debris |
| | Felician College South | mixed forest; shrub/scrub | woody debris; sandbar with gravel and cobble |
| | Lodi Cemeteries | mixed forest; shrub/scrub | steep banks; sparse trees on edge of cemetery; silt and sand substrate |
| | Ox Bow | mixed forest; shrub/scrub | steep banks; sparse large woody debris; sparse large rocks on shoreline |
| Second River | Belleville | mixed forest; shrub/scrub | bulkhead along both banks; cobble substrate; walkway |
| | Bloomfield | mixed forest; shrub/scrub | bulkhead along both banks; sand and cobble substrate; overhanging vegetation; maintained lawn above left bank (at bridge); Morris Canal site; larger trees along canopy of left bank |
| | Mills | mixed forest; shrub/scrub | steep banks but no bulkhead; steep descent from residences at top of left bank (~150 ft above); large canopy trees; sparse understory along both banks; cobble, gravel, and sand substrate with garbage debris; concrete debris; overhanging vegetation (not dense); some large woody debris |
| | Passaic | mixed forest; shrub/scrub | bulkhead along left bank with building above, bulkhead with river walk above along right bank; large woody debris in stream; cobble; minimal overhanging vegetation |

Table 3-9. Plant community and habitat features along the tributary survey locations

| Tributary | Location | Plant Community | Habitat Features |
|-------------|--------------------------|---------------------------|---|
| | Watsessing Park | mixed forest; shrub/scrub | left bank – bulkhead and steep bank; right bank – bulkhead; cobble, gravel, sand, substrate; overhanging vegetation; concrete debris, large rocks; canopy predominantly closed canopy with concrete path parallel to railroad bridge |
| | Wigwam Brook | mixed forest; shrub/scrub | bulkhead on both banks; right bank is mostly lawn; left bank has sparse small trees |
| Third River | Bonsal Wildlife Preserve | mixed forest; shrub/scrub | steep left bank up to residences and sparse understory growth on slope; small creek coming along right bank; cobble, gravel, and sand substrate; side streambed with woody debris and overhanging vegetation; wide streambed with riffles and small pools; few large trees; exposed roots |
| | Clarks Pond | mixed forest; shrub/scrub | edge of ball field along left bank; appears to have been planted with riparian vegetation; path along shoreline; pond is dammed; closed tree canopy with overhanging vegetation and large woody debris along right bank |
| | Clifton Pond | mixed forest; shrub/scrub | steep left and right bank; sparse tree cover along left bank; dense but narrow strip of tree cover along right bank |
| | Forest Hills Field Club | mixed forest; shrub/scrub | edge of parking lot in apartment complex along right bank; snag |
| | Glen Ridge Country Club | mixed forest; shrub/scrub | shallow banks; sand substrate; large woody debris on banks; concrete debris in water |
| | JFK Parkway | mixed forest; shrub/scrub | bulkhead; cobble, silt and sand substrate; park surrounding brook upstream on right bank and downstream left bank; fenced shoreline and businesses. |
| | River Mouth | mixed forest; shrub/scrub | overhanging vegetation on left bank; paved fenced walkway with plantings above river walk along right bank |

Table 3-10. Common plant species identified at the LPRSA tributary survey locations

| Common Name | Scientific Name | Status ^a |
|-------------------------|-----------------------------|----------------------|
| Arrow-wood viburnum | <i>Viburnum dentatum</i> | native |
| Ash (unidentified) | <i>Fraxinus</i> spp. | |
| Black locust | <i>Robinia pseudoacacia</i> | native (naturalized) |
| Boneset (unidentified) | <i>Eupatorium</i> spp. | |
| Catalpa | <i>Catalpa speciosa</i> | native |
| Cattail (unidentified) | <i>Typha</i> spp. | |
| Common ivy | <i>Hedera helix</i> | non-native |
| Common reed | <i>Phragmites australis</i> | native |
| Common smartweed | <i>Polygonum hydropiper</i> | |
| Dame's rocket | <i>Hesperis matronalis</i> | non-native |
| Duckweed (unidentified) | <i>Lemna</i> spp. | |
| Eastern cottonwood | <i>Populus deltoides</i> | native |

Table 3-10. Common plant species identified at the LPRSA tributary survey locations

| Common Name | Scientific Name | Status ^a |
|----------------------------------|---|---------------------|
| Elm (unidentified) | <i>Ulmus</i> spp. | |
| Goldenrod (unidentified) | <i>Solidago</i> spp. | |
| Hickory (unidentified) | <i>Carya</i> spp. | |
| Honeysuckle (unidentified) | <i>Lonicera</i> spp. | |
| Iris (unidentified) | <i>Iris</i> spp. | |
| Japanese knotweed | <i>Fallopia japonica</i> , syn. <i>Polygonum cuspidatum</i> | non-native |
| Jewelweed (unidentified) | <i>Impatiens</i> spp. | |
| Lady's thumb | <i>Persicaria maculosa</i> | non-native |
| Locust (unidentified) | <i>Gleditsia</i> spp. or <i>Robinia</i> spp. | |
| Maple (unidentified) | <i>Acer</i> spp. | |
| Multiflora rose | <i>Rosa multiflora</i> | non-native |
| Northern red oak | <i>Quercus rubra</i> | native |
| Norway maple | <i>Acer platanoides</i> | non-native |
| Ornamental cherry (unidentified) | <i>Prunus</i> spp. | |
| Pink smartweed (unidentified) | <i>Polygonum</i> spp. | |
| Poison ivy | <i>Toxicodendron radicans</i> | native |
| Pokeweed | <i>Phytolacca americana</i> | native |
| Privet (unidentified) | <i>Ligustrum</i> spp. | |
| Purple loosestrife | <i>Lythrum salicaria</i> | non-native |
| Red maple | <i>Acer rubrum</i> | native |
| Scarlet oak | <i>Quercus coccinea</i> | native |
| Silver maple | <i>Acer saccharinum</i> | native |
| Snakeroot (unidentified) | <i>Ageratina</i> spp. | |
| Spice bush | <i>Lindera benzoin</i> | native |
| Sycamore | <i>Platanus occidentalis</i> | native |
| Tree-of-heaven | <i>Ailanthus altissima</i> | non-native |
| Tuliptree ^b | <i>Liriodendron tulipifera</i> | native |
| Virginia creeper | <i>Parthenocissus quinquefolia</i> | native |
| Weeping willow | <i>Salix babylonica</i> | non-native |
| Willow oak ^b | <i>Quercus phellos</i> | native |

^a Native/non-native status was only provided for plants identified to the species level, where available (NRCS 2010).

^b Species identified by USEPA oversight personnel.

3.2.3 Summary of tributary wildlife observations

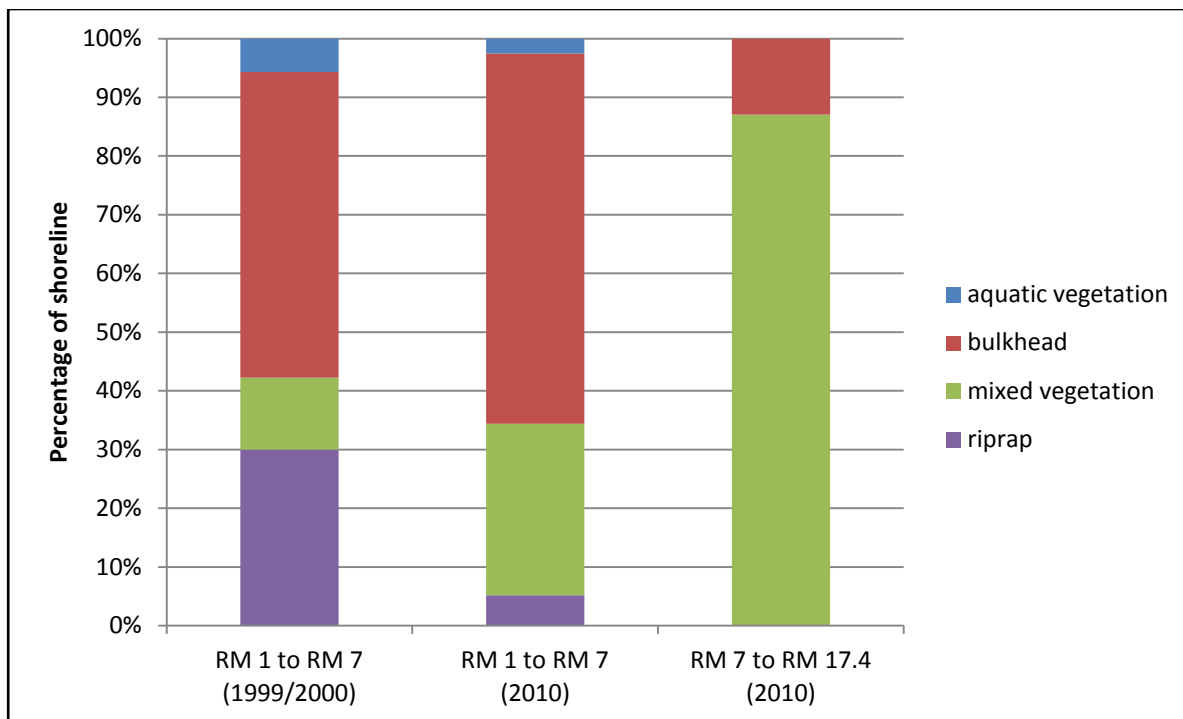
All the wildlife that was incidentally observed along the tributary locations during the survey was birds (Table 3-11). Two fish species (i.e., common carp [*Cyprinus carpio*] and an unidentified bass species) were also observed swimming.

Table 3-11. Wildlife observations along the tributary survey locations

| Tributary | Location | Wildlife Observed | |
|--------------|-------------------------|-------------------|-------------------------------|
| | | Common Name | Scientific Name |
| Saddle River | Felician College South | gray catbird | <i>Dumetella carolinensis</i> |
| | | mallard duck | <i>Anas platyrhynchos</i> |
| | Lodi Cemeteries | American robin | <i>Turdus migratorius</i> |
| | | gray catbird | <i>Dumetella carolinensis</i> |
| Second River | Mills | American robin | <i>Turdus migratorius</i> |
| | Wigwam Brook | gray catbird | <i>Dumetella carolinensis</i> |
| Third River | Glen Ridge Country Club | downy woodpecker | <i>Picoides pubescens</i> |
| | | Canada goose | <i>Branta canadensis</i> |
| | JFK Parkway | mallard duck | <i>Anas platyrhynchos</i> |
| | | Canada goose | <i>Branta canadensis</i> |

3.3 COMPARISON OF 2010 SURVEY AND HISTORICAL SURVEYS

Tierra Solutions conducted a habitat characterization survey on the lower portion of the LPRSA (RM 1 to RM 7) in fall 1999 and spring 2000 (Tierra Solutions 2002). The 1999 and 2000 habitat surveys were conducted in a manner similar to that of the 2010 survey, in which observations of shoreline characteristics were made by boat, video recording was made in all areas surveyed, and shorelines were classified into four general categories (i.e., aquatic vegetation, bulkhead, riprap, mixed vegetation). Tierra Solutions reported that of the total shoreline (left and right banks) approximately 52% was bulkhead, 30% riprap, 12% mixed vegetation, and 6% aquatic vegetation; over 80% of the total shoreline was bulkhead and riprap, with little habitat value. In comparison, the 2010 survey of the same section of the LPRSA (i.e., RM 1 to RM 7) identified that the total shoreline is 63% bulkhead, 5% riprap, 29% mixed vegetation, and 3% aquatic vegetation (Figure 3-3). Although the differences in the percentages among shoreline categories between the 1999/2000 and 2010 surveys can be attributed, in part, to the subjective nature of the observations and the seasonal differences between the surveys; the increase in mixed vegetation can also be attributed to the amount of shoreline vegetation that has overgrown riprap and/or bulkhead over the course of 10 years (e.g., attributable to lack of maintenance).



Source of 1999/2000 data from RM 1 to RM 7: Tierra Solutions (2002)

Figure 3-3. Comparison of shoreline by habitat classification along the mainstem LPRSA during the 1999/2000 and 2010 surveys

The habitat and plant community observations made during the habitat identification survey are consistent with observations made during other surveys, specifically, the ecological benchmark survey conducted in 2005 (Shisler et al. 2008) and the vegetation sampling, wetland delineation, and bio-benchmark survey conducted in 2006 (USACE et al. 2008). Neither of these surveys was a continuous shoreline survey, but both examined specific locations for habitat attributes. Similar plant community observations were made during both surveys, and locations of specific habitat types (e.g., locations of mudflats or emergent marsh vegetation) appear to be consistent.

4 Summary

The results of the habitat identification survey revealed that the shoreline of the mainstem LPRSA is dominated by mixed vegetation (over 60% of the shoreline), which typically consisted of riprap, bulkhead, or natural bank with scrub/shrub or forest vegetation growing on top. Bulkhead and riprap alone, without vegetation, were also prevalent (approximately 35% of the shoreline), particularly along the lower portions of the LPRSA (RM 0 to RM 10). Aquatic vegetation constituted the smallest percentage of shoreline, approximately 1%.

The results of the habitat identification survey indicate that direct human access to the river in the lower 6.7 miles is limited because of the nature of the shoreline (i.e.,

vertical bulkhead) and industrial land uses adjacent to the river. Human access along the left bank between RM 6.7 and RM 16.2 is also limited by the presence of Route 21 and the primarily bulkheaded shoreline. There are several parks and residential areas where access to the water is possible along the right bank between RM 6.7 and RM 16.2. In this area, the shoreline is dominated by vegetation, often growing over armored banks, with stretches of bulkhead and riprap. RM 16.2 to RM 17.4 is vegetated and slopes down to the water on both sides of the river. Access to the water is possible throughout much of this upper stretch of river.

The 18 sites surveyed along the three tributaries were dominated by residential, commercial, or recreation land uses. The mixed-vegetation shorelines varied from steep banks with riprap or other decaying bank armor to shallow sloped banks with sand or gravel bars. The majority of the shorelines were shaded by canopy trees with scrub vegetation in the understory. Several shorelines were adjacent to trails or walkways with limited understory vegetation.

During the 2010 habitat identification survey, gulls, Canada geese, mallards, great blue herons, robins, catbirds, and woodpeckers were observed throughout the LPRSA mainstem and tributaries. Turtles, rats, groundhogs, carp, and bass were also observed throughout the LPRSA. Wildlife observations made during this 2010 field effort were consistent with observations made during previous sampling events, in particular the 2009 and 2010 fish and benthic community sampling events (Windward 2010a, b; 2011b, in prep.), and the summer and fall 2010 avian community surveys (Windward 2011a).

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APPENDIX A: FIELD FORMS

HABITAT IDENTIFICATION SURVEY FORMS

LPRSA Habitat Identification Survey Form

Date: 092010 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature: Low 70°

Surveyor(s): MW, TD, MD, JR, GM Time and height of low and high tides: 7:15 H, 1:30 L

Starting point location (bank, landmarks): IB opposite clock End point location (bank, landmarks): RB, RMB

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|--------------|--|-----------------------------------|-------------------------------|--------------------------|--|--|
| 0835 0849 | saved as w points WP1=734136N, 596992E | WP1-2 | | | Bulkhead (steel) | scr/shr = for above bulkhead tr = EA CW, tree of heaven se/shr = katalpa, sumac, JA |
| 0858 | WP2=734004N, 596936E WP3=733801, 596861 | WP2-3 | | | Bulkhead (concrete) | same as above |
| | WP4= 733520 596826 WP4= | WP3-4 | | | Bulkhead (steel) | Novesg - Hwy 21 above |
| 0905 | WP5= 732181, 596592 WP5= | WP4-5 | | END @ 645 | Bulkhead (concrete) | scr/shr = for above bulkhead CW, katalpa, JA, oaks, knotweed, maples low snags, some overhanging veg |
| 0915 | WP6= 731767, 596458 | 5-6 @ Union St. Bridge | | | Mixed Veg Riprap/ Mixed veg | Overhanging veg. - maples Riprap at water's edge to Union St. Bridge |

EA CW = Eastern cottonwood

JA = tree of heaven

JA kw = Japanese knotweed

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|-----------------------------|-----------------------------------|-------------------------------|------------------------------------|--|---|
| | WP7 = 731494, 596297 | WP5 (7) | | | Riprap/ Mix Veg | Same tree/sca/shr species likely Norway Maple, cw Sycamores, ash, possible Am Elm or AA |
| | | | | | | SCR/shr - honeysuckle* |
| 0930 | WP8 = 730632, 595483 | 7-8 | | 1335 = end | steel + concrete Bulkhead/ Mix Veg | FOR / sca/shr (Black locust) cw, Norway, AA, JAP KW, small black locust Snag, overhanging veg |
| 0942 | 9 = 728045, 596923 | 8-9 | | 1853 (dead tree LWD) 2435 (end) | Mixed veg, Riprap | overhanging veg, Norway, elm?, AA Sycamore, willow* Snag, Knotweed, LWD (dead trees in water) |
| | | | | | | Asariz bitter-sweet ash Virginia Creeper |
| | WP10 = 727225, 596810 | 9-10 | | | (concrete) Bulkhead/ Mix Veg | For = ash?*, AA SCR/shr = JAP KW, Rose* (multiflora) |
| 1004 | WP11 = 726432, 596674 | 10-11 | | 2930 = end (WP11) | Bulkhead (no vegetation, Hwy 21) | Loosestake in outfall pipe |

* grab specimens

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|---------------|-----------------------------|--------------------------------------|-------------------------------------|---|------------------------------------|---|
| 1006 | WP12 = 724918, 596071 | 11-12 | | Rt 3 Bridge = WP12 | Bulkhead/ Mixed veg | Sck/shr under Hwy 21 = AA, Black locust Fox JAP KW elm, CW |
| | WP13 = 724700, 595917 | 12-13 | | 3435 = end | n | Sck = JAP KW Fox = AA, oak, |
| 1015 | WP14 = 724415, 595075 | 13-14 | | 3610 | Riprap/mixed | GBT, Kingf = birds obs Same Fox + sck/shr as above |
| | WP15 = 724232, 595458 | 14-15 | | WP 15 = Lyallhurst Conrail Draw Bridge | mudflat/ mixed veg | Same tree + shr spp LWD, snags, oaks on mudflat |
| 1019 | WP16 = 724146, 595280 | 15-16 | | 16 = 3820 | Riprap/ mix veg | Same spp |
| | WP17 = 724067 595031 | 16-17 | | 17 = 3920 | mudflat/ mix veg | Black locust, CW, LWD |
| 1022 | WP18 = 723756 594491 | 17-18 | | 18 = Third River | Riprap/ mix veg | locust, ash*, sycamore, elm, oak (white?) hickory, Rocking snags, overhanging veg |

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|----------------------------|-----------------------------------|-------------------------------|-------------------------------------|--|---|
| | WP19 = 723825 594201 | 18-19 | | 4300 = WP19 | Bulkhead / Mudflat <i>(3rd time)</i> | veg on top of bulkhead = CW, JAP KW (locust) snags |
| 1030 | WP20 = 723694 593756 | 19-20 | | 4420 = WP20 | Bulkhead/ Mixed Veg | oak, maple, 1 AA, JAP KW |
| 1033 | WP21 = 720904 592068 | 20-21 | | 5225 = WP21 | Bulkhead/ Mixed Veg | kingfisher (same?), turtle sunning, <i>GPB (same?)</i> CW, AA, locust, maple, willow, sycamore, CW purple loosestrife, JAP KW, katalpa elm |
| | | ↓ | | ↓ | | snags <i>grows in between cracks along wall</i> veg gets very sparse along Hwy 21 (immense) silk tree (not dominant, but more common) |
| | WP22 = 720508 592050 | ↓ WP21 = Nutley Boat Ramp | | ↓ | | loosestrife increasing LWD (down trees in water) silk tree = ↑ in dam |
| 1041 | WP23 = 719711 592036 | 21-22 23 | | WP22 = DeJessa Bridge 5435 = end | Bulkhead/ Mix Veg | AA, JAP KW, willow, maple, dam*, locust overhanging veg, down tree |
| 1057 | WP24 718841 591813 | 23-24 | | 210 = end | Riprap/ Mix Veg | AA, maple, willow, katalpa, sycamore, ash* CW, JAP KW snags, overhang, LWD |

END OF
TAPE

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|----------------------------|---|-------------------------------|--|---|---|
| 1054 | WP25 = 712985 590314 | 24-25 | | along Hwy 21 under powerlines | Bulkhead, Max Veg | loosestake growing out of bulkhead cracks AA, TAPKW = SCR gulls, Robs Barn Swallows? Black locust (tree) ^{maple} mimosa, katalpa |
| | | ↓ | | ↓ | ↓ | trees become more dense after powerlines oak, maple, ash, elm, sycamore snags, bird (down trees) JRP KW + Rose veg gets sparse again by Hwy 21 RW BB |
| 1106 | WP26 = 711938 589792 | 25-26 | | 1420 = end at WP25 | Bulkhead next to Hwy 21 | No veg except few shrubs growing out of wall |
| 1108 | WP27 = 711443 589547 | 26- 28 27 (WP28 = R+7 Bridge) | | 1552 = WP27 | Riprap/ Max Veg | loosestake, TAPKW, AA, elm? mimosa, locust |
| 1113 | WP28 = 711547 589604 | 27-29 | | confluence w/ 2nd River ↓ 1910 = WP29 mudflat | Bulkhead along Hwy 21 | No veg except for few plants growing out of wall |
| | WP30 = 709193 589429 | 29-30 | | | mudflat at Bulkhead Max Veg | confluence of 2nd River (just upstream) Bulkhead above |

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|---|-----------------------------------|--|---|--|--|
| | WP31 = 708642 589462 WP32 = 708056, 588938 | 30-31 | | 2055 = WP31 | Bulkhead/ Mix | AA, JAP KW, |
| 1121 | WP33 = 707532 588432 | 31-33 | WP32 = CONCRETE W. Arlington Drawn Bridge | 2355 = WP33 | Bulkhead along Hwy 21 | No veg |
| | WP34 = 705730 587155 | 33-34 | | [extends from WP32 to 33] 2715 = WP34 | Mudflat bulkhead/rip rap mix veg | Deco perched on piling gulls, cormorant snags, LWD, very narrow band of JAP KW on top, AA, maple, syc, will veg |
| 1130 | WP35 = 705423 587154 | 34-35 | | 2815 = WP35 | Rip rap/ mix veg | Samuelson spp, snags, LWD debris on shoreline piling in water |
| 1131 | WP36 = 704452 586883 | 35-36 338 | | WP38 = 3745 | Bulkhead (shell, concrete, wood) | few trees on top of bulkhead AA, katalpa, locust, JAP KW |
| 1135 | WP37 = 703094 585998 | 36-37 | | | Mudflat (below bulkhead) | gulls |
| 1143 | WP38 = 701176 585066 WP39 = 700456, 585019 | 38-39 | | | Bulkhead | No veg |

Deco = double-crested
cormorant

will = willow
Syc = Sycamore

JAP KW = Japanese knotweed
underlined = dominant (#1)

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|----------------------------|-----------------------------------|--|--------------------------|---|--|
| 1145 | WP40 = 700044 585009 | 39-4042 | WP40 = Rail road bridge, permanently raised | | Bulkhead, Riprap | Sparse veg on top of bulkhead (JAP KW, AA) (Princess Tree?) Snag |
| | WP41 = 648771 584795 | | WP41 = Clay St Bridge WP42 = 4252 | | | |
| 1152 | WP42 = 647940 584670 | 42-43 | 280 Bridge = WP43 WP43 = 4312 | | <u>mudflat</u> w/ bulkhead + sparse veg on top | |
| | WP43 = 647701 584636 | 43- 44 = | Newark/Hampden Bridge Rail Bridge downstream of 280 Bridge | | Bulkhead in B two bridges | |
| 1158 | WP44 = 647308 584622 | 44 = 46 | WP44 = 4730 WP45 = Bridge St Bridge | | Bulkhead | Sparse veg on top of bulkhead same spp <u>AA</u> |
| 1245 | WP45 = 694632 584648 | 46-50 | WP49 = Amtrak bridge | | Bulkhead | grass, sparse veg above bulkhead |
| | WP46 = 644901 585118 | 47-48 48-49 | WP50 = Jackson St Bridge | | Mudflat below FBI | some sections, trees are present above Bulkhead above (AA) |

WP47 = 694524, 585212

↳ 5235

WP48 = 694330, 585249

WP49 = 693167, 585909

WP50 = 692224, 587592

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Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|----------------------------|-----------------------------------|-------------------------------|--------------------------|--------------------------------------|---|
| 1254 | WP52 = 692894 590660 | 51 50 - 52 | | 57:30 = WP52 | Riprap/ Mixed Veg old bulkhead | AA, Sycamore, same spp as all day |
| | WP51 = 692451 590082 | 50 - 51 | | | mudflat | from bridge to concrete wall somewhat steep in areas |
| 1305 | WP53 = 693550 590960 | 52 - 53 | | WP53 = 01:20 | Bulkhead | large grasses + small herbaceous (unid) on top, small snags some phragmites on top, AA, large cw tree |
| 1308 | WP54 = 694210 591339 | 53 - 54 | | | Riprap/ Mix Veg on top | Ash, AA, cw, syc. snag Herb - common spp may be (Munawthous) spp. |
| | WP56 = 694597 591729 | 54 - 56 | | WP56 = 04:27 | Bulkhead | |
| | WP55 = 694370 591438 | 55 - 56 | | | Mudflat below bulkhead | |
| | WP57 = 694782 591991 | 54 56 - 57 | | | Riprap/ mix | |

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|---------------|---------------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|---|
| | WP58= 695069 592795 | 57-58 | | | Mudflat | Diamond Alkali site |
| 1318 | | 57-58 | | | Bulkhead | " sparse veg on top of bulkhead |
| | WP59= 695113 593602 | 58-59 | WP59= 0903 | | " | " |
| | WP60= 695152 593874 | 59-60 | | | Mudflat (bulkhead above) | sparse herb veg on top = mugwort mystery shrubbery amarantaceae pigweed |
| | | 59-60 | | | Bulkhead | |
| | WP61= 695190 594525 | 60-61 | | | Bulkhead | sparse w/ herb veg on top |
| | WP63= 695287 594390 | 61-63 | | | mudflat & | to Bridge |

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|----------------------------|--|---|--------------------------|---------------------------------|--|
| | WP62 = 695314 595885 | 61 - 63 62 WP62 | | | Riprap/ Mix Veg | Jap kn, mostly scr/shr + herbs veg Mugwort + some few trees grasses |
| | | 62 - 63 63 | WP 63 = Morris Canal Turnpike / Bridge | | Ag. Veg + Mudflat | Phragmites above mudflat |
| 1337 | WP64 = 695064 597148 | 62 - 64 | WP 64 = 19:00 on tape WP 64 = P + NP + Bridge | | mudflat w/ Herb veg above | Phragmites, Mugwort, Amaranthus |
| 1337 | WP66 = 694332 597991 | 64 - 66 | | | Bulkhead | ducks, gull sparse veg on top (AA trees + shr) patches of herb veg (mugwort) |
| | WP65 = 694710 597675 | 65 - 67 | WP 67 = Pulaski Skyway | | Mudflat | egret on mudflat wood debris ends at Morris Canal Rocks Spartina patch at M Canal Phragmites |
| | WP67 = 693027 598103 | 67 - 68 | WP 68 = Truck 1 + 9 Bridge | | Mixed Veg w/ some riprap | scr/shr, few trees AA, Jap kn + narrow mudflat |
| 1346 | WP68 = 691871 597912 | 68 - 69 | | | Riprap | Sparse herb veg on top of bank mugwort |

WP69 = 691260, 597777

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|---|----------------------------|-----------------------------------|-------------------------------|--|---|--|
| 1349 | WP70 = 691019 597739 | 69-70 | | | Bulkhead/ riprap (where bulkhead fell apart) | Sparse veg on top mugwort RA horsetweed goldenrod AA |
| | WP71 = 690236 597513 | 70-71 | | WP71 = 28.00 | Mudflat Riprap behind/along | Gulls |
| | WP72 = 684375 596882 | 71-72 | | WP72 = 34.45 | Riprap + Bulkhead | Sparse veg on top, few LWD end LB @ Pass valley scum |
| END OF LB SURVEY — START OF RIGHT BANK @ Kearney Pt | | | | | | |
| | WP73 = 685913 598608 | 73-74 | | | Aq Veg | Kearney Pt Spartina, Phrag trees up above Canada Geese gulls |
| | WP74 = 686326 598224 | 74-75 | | | Riprap (some bulkhead mixed in) | Small pocket of Phrag/Spartina (only < 20') No veg on top |
| 1419 | WP75 = 688520 597357 | 75-76 | | 50:15 = Truck 1 + 4 Bridge 51:35 = Pulaski Skyway | Bulkhead | No veg end transect at upstream of bridge (China man) |
| | WP76 = 693804 598419 | | | | | |

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|----------------------------|-----------------------------------|---|--------------------------|---------------------------------|---|
| 1429 | WP77 = 695604 595240 | 76-77 | WP76 = 53:40 | | Riprap/ mixed veg on top | CW, AA pilings (DCCO) mugwort, JAP kw Phrag patches: dark brown |
| | | | PT ND PT Bridge = 57:45 Pulaski Skyway = 58:30 | | Bulkhead | DCCO small sections of bulkhead interspersed |
| 1440 | WP78 = 695302 592760 | 77- 78 78 | | | Bulkhead | Sparse Herb/Succ/shr on top Goldenrod, JAP kw, mug, small AA, Phrag |
| | WP79 = 695107 592463 | 78-79 | 06:10 = WP79 | | mudflat | |
| | WP80 = 695029 592069 | 79-80 | | | Aquatic veg | Spartina + Phrag above rip rap rocky shoreline |
| | WP81 = 694727 591457 | 80-81 | 81 = 07:40 | | Mixed Veg | " few trees mostly succ/shr = Phrag, JAP kw, CW coast |
| | WP82 = 694439 591107 | 81-82 | | | Riprap/ mixed veg | knights - fishing in water Black locust trees, oak |

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|------------------------------|-----------------------------------|---|--------------------------|---|---|
| 1449 | WP83 = 692709 58889816 | 82-83 | 83 = 12:45 | | Mudflat | Small channel Aq Veg = Phrag, Spargang |
| | | ↓ | ↓ | | ↓ | Backed by trees (ow, locust, JAPKw) GBT on mudflat, mallard Goldenrod = Em veg, mugwort |
| | WP84 = 692549 588863 | 83-84 | 84 = 13:40 | | Mixed Veg | Rocky shoreline Katalpa + Black locust snags, pilings same tree, shrubs, herb spp |
| | WP85 = 692529 587781 | 84-85 | 15:50 WP85 = Jackson St Bridge | | Mudflat | Gulls large wood debris, pilings scr/shrub veg above (JAPKw) small ART |
| | WP86 = 692386 587238 | ↓ | ↓ | | ↓ | Em = mugwort, Amar, goldenrod tree = ART, maple, |
| 1459 | WP88 = 696424 584855 | 85-88 | WP88 = Bridge St Bridge WP86 = 10:50 | | Bulkhead (small sections of r.p.pap) | Past Bridge (up stream) No veg few trees growing out of it (Katalpa, ART) |
| | WP87 = 692842 586363 | 86-87 | WP87 = 18:40 | | Mudflat | Below bulkhead Gull princess tree elm? ow locust |

Ambrek Bridge = 19:20

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|----------------------------|---|---|--------------------------|---------------------------------|---|
| 1510 | | 88 - 280 Bridge coordinate | WP88 = 25:00 Newark Harbor Bridge = 26:520 | | Riprap | sparse veg. katalpa, AA, JAP kw, locust |
| | | WP43 | 280 bridge = 26:50 | | | Canada Geese, Gull |
| | WP89 = 700806 585274 | 280 Bridge (WP43) 89 - 89 | | | Bulkhead | No - sparse veg on top of wall → same list as above. |
| | | | 30:45 = Newark Suck's Bridge | | (small parts of riprap) | oak, Black locust, AA, JAP kw, cw Dom SHR |
| 1520 | WP90 = 701588 585464 | 89 - 90 | WP90 = 34:30 | | Mudflat | Rocky shoreline + mix veg above cw, ash, AA = tree JAP kw = SHR GBH Herb = Amak, mag = HERB = AA |
| | WP91 = 702481 585832 | 90 - 91 | | | Riprap/wall | sparse veg above |
| | WP92 = 703121 586337 | 91 - 92 | WP91 = 36:05 | | Bulkhead | No veg - sparse, few trees on top of wall |

GBH = Great Blue Heron

purple loosestrife

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|------------------------------|-----------------------------------|--------------------------------------|--------------------------------|---------------------------------|--|
| | WP93 = 704 812 587 204 | 92-93 | Kearney Boat Ramp = 38:15 - 38:25 | | Mixed | Rocky shoreline, pines trees = Locust, AA, Maples |
| | | | | | | Groundhogs (2) JAP KN |
| | WP94 = 706 506 587 968 | 93-94 | WP94 = 44:10 | | mudflat | Rocky shoreline + mixed veg above maple, willow, ash, AA, <u>locust</u> , katalpa, JAP KN |
| 1534 | | 94-96 | | | Riprap/ mudflat | snags, rootwad, LWD, Rocks same tree list above JAP KN = STR |
| | | | 47:30 = | conrail w. Arlington Bridge | ↓ | Purple loosestrife @ dock Kingfisher Box elder, willow oaks, locust, sycamore, elms, maple AA, ash |
| | WP96 = 711 305 587 688 | | | | | Overhanging veg, LWD |
| 1552 | WP95 = 710 912 587 630 | 95-96 | 52:40 | | mudflat | |

END OF SURVEY 09.20.10

15 of 15

may be
containing
in
freshwater
habitat
(pools)
appears to
continue
upland

LPRSA Habitat Identification Survey Form

Date: 09.21.10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature: low 60's

Surveyor(s): MW, TD, MD, JR, GM

Time and height of low and high tides: 8:00 Hi, 14:15 Lo

Starting point location (bank, landmarks): LB, ~RM 35 opp CP ^{date} End point location (bank, landmarks): Dondoe Dam

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on xxx Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|--|--|---|--------------------------|---------------------------------|---|
| 0823 | 97 WP97 = 734138, 596989 | 97 - 98 | | | Mixed | Forested = Black locust, maples, CW, AA |
| | WP98 = 734883, 597276 | 98 - 99 | WP99 = 06:00 | | Bulkhead/ Mixed | Same forested, transitioning to shrub down. JAP KW, small AA = shrub snags, downed tree |
| 0833 | WP99 = 736102, 597331 | 99 - 100 | 06:55 Main WP100 = Gregory Ave Bridge | | Mixed | willow, maple, CW, (silver) |
| | WP100 = 736408, 597252 | 100 - 101 | WP101 = 07:40 | | Bulkhead | Small shrub = elm, JAP KW |
| | WP101 = 736509, 597220 WP102 = 736791, 597134 | 101 - 102 | | | Mixed | For = AA, Maple (NOR), princess trees, silver snags, overhanging |

** Way points

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|---------------|-----------------------------|--------------------------------------|-------------------------------------|--|------------------------------------|--|
| | WP103 = 738071 597427 | 102-103 | | WP103 = Dundee Canal Raceway | Bulkhead | Sparse trees + shr = AA, maple (Nursery - many trees/shr above) |
| | WP104 = 738442 598281 | 103-104 | | 2nd St. 3rd St. Bridge WP104 = 16:00 | Bulkhead | White water-looking flow = at Snags ? JAP KW Boneset |
| | | | | | | FOR = Syc, maples, elm, AA Princetree |
| 0049 | WP105 = 738465 598563 | 104-105 | | | Bulkhead | Sparse trees - shr / herb maple AA PL |
| | WP106 = 737348 599392 | 105-106 | | WP106 = 21:40 | Mixed | FOR = Elm, CW, willow, maple, AA, Locust Snags, GBH, overhanging veg. |
| | | | | | | Small areas where shrubs dominate AA + JAP KW + Locust |
| | WP107 = 737118 599382 | 106-107 | | | Bulkhead | Few trees above (Oak, AA) |

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|-----------------------------|-----------------------------------|--|--------------------------|---------------------------------|--|
| | | 106-107 | WP107 = 27:45 | | Mudflat | JAP kw, Ploose & above |
| | WP108 = 736864 599508 | 107-108 | | | Mixed | For/scribble = cw, oak, Box elder she = JAP kw |
| 0401 | WP109 = 736732 599722 | 108-109 | | | bulthead | line of tree + she = cw, AA, locusts, maple |
| | WP110 = 736752 600206 | 109-113 | 26:35 = WP110 = ^{8th St} MAIN Bridge | | Mixed | small trees = catalpa, AA, willow, after Bridge, larger trees: AA, ^{narrow tooth} elm ^(Black 3) elm |
| | WP113 = 741813 599094 | | | | | Katalpa, AA, willow, Box elder, locust, syc. she = JAP kw = small pockets maple GBH |
| | WP111 = 740134 600013 | | WP111 = ^{Passar 2 St.} Bridge = 39:50 | | | wood: downed trees, lots of overhanging veg, snags = pocket of Hickory? * smooth, ridgy bark (grey) shorter stature tree (not canopy) |
| | WP112 = 741593 599308 | | WP112 = 2 Bridges @ RM16 (Minreest Bridge) 46:05 | | | Small pockets of herb = boneset, snakebent, PL Small section of wall with overhanging veg (pink) |

Syc. = sycamore

Birds obs mixed:
Robins, BAW, GBH,

32-11

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|-------------------------------|-----------------------------------|---|--------------------------|---------------------------------|---|
| 0942 | WP114 = 742 068 598 850 | 113-114 | | | Bulkhead | spurge trees on top; maples + oaks pockets of herbs sticking out & will = PL |
| | | 114 | END OF LB TRANSECT, START RB TRANSECT | | | |
| 0947 | WP116 = 738234 597790 | 114-116 | W. R. ST BRIDGE = 53:20 | | Mixed | Mallards, McDuff FOR = willow, Syc, maple, catalpa, AA, elm SHR = JAP KW, willow, dogwood (Redorange?) downed wood*, LWD, Snags lots of willows in water (dead+alive) SHR = AA, JAP KW |
| | WP115 = 73906609 600700 | | RR track = 53:40 PASSAGE ST BRIDGE (TAP 6) | | ↓ | Herb pockets = snakeroot, EE, pokeweed (Purple) (understory) jewel-weed Virginia creeper |
| | | | Saddle River = 04:15 = WP115 St Bridge = 17:40 | | ↓ | Tree (cont'd) = CW, ash?*, locust small pocket of bulkhead upstream of 8th St. Bridge willows - black? yellow?, weeping (not common) |
| | | | Small boat ramp = 24:25 | | ↓ | |
| | | | 2nd St Bridge = 28:00 - mallards WP116 = 30:00 | | ↓ | |

* = took example photo

(+) warblers (yellow?), kingfisher
groundhog
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Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|-----------------------------|-----------------------------------|-------------------------------|--------------------------|---------------------------------|--|
| 1040 | 118 = 736686 597354 | 116-118 | | | Bulkhead | sparse veg - trees (CW) PL sticking out of wall |
| | 117 = 737278 597398 | 116-117 | | | Mudflat | tree cover increases = same list as above GBH, Gulls Canada Geese on mudflat |
| | | | WP118 = 35:40 | | | downed tree over bulkhead Snag = wall ends at snag |
| 1047 | WP119 = 734033 597125 | 118-119 | Main St Bridge = 37:00 | | Mixed | Tree cover - same list as above Pockets of stragg = JAP KW - w/ no tree cover - or w/ no tree cover Snags |
| | | ↓ | | | ↓ | other herbs = PL, Snakeroot, pokeweed tree list cont'd = hickory (or walnut)* |
| 1057 | 120 = 733611 596995 | 119-120 | WP120 = 44:55 | | Bulkhead | C&G Field facility |
| 1143 | 121 = 733457 596943 | 120-121 | WP121 = 45:20 | | Mixed/Leap | CW |

CW = cottonwood
PL = purple loosestrife

Birds: Robin

Sof 4

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|---------------|---------------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|--|
| | 122 = 732778 596814 | 121-122 | WP 122 = 27:00 | | Bulkhead | Narrow band of trees on top cw, maple, AA |
| 1/14 | 123 = 731576 596609 | 122-123 | Union St Bridge = 49:20 | | Mixed | FOR (Narrow band): cw, locust, elm, oak maple, willow, ash?, katalpa ^{sycamore} (red?) down wood, Snags, |
| | | | | | ↓ | Shr level = katalpa, AA, willow understory maples = silver + norway |
| | | 123 124 | | | Bulkhead | Residential wall ~ 100' long |
| | 124 = 728938 596873 | 123-124 | | | Mixed/ Bulkhead | Small pockets of residential wall in various states of disrepair FOR -> narrow band of trees (same list as above) |
| | 125 = 728436 597079 | 124-125 | | | Mixed | FOR: oaks damned wood/LWD |
| 12/04 | 126 = 727655 597062 | 125-126 | | | Riprap/mixed/ Bulkhead | pockets of residential - shr = PL, dogwood ornamental grass |

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|--------------------------|-----------------------------------|-------------------------------|-------------------------------------|---------------------------------|---|
| 1209 | 127= 727428 596998 | 126-127 | | WP 127: 7:00 | Bulkhead | Nereid Boat Club Herb cover above wall - Pi, ragweed? yellow |
| | 128= 724705 596227 | 127-128 | | | Mixed/Riprap/ Bulkhead | Mostly mixed ^{riprap} , pockets of bulkhead ^{to residential} Narrow band of trees, residential plantings |
| | | | | Rt 3 Bridge = 17:30 " = WP 128 | | Trees = Elm, oak (black?), syc, cw shr/under = Box elders, JAP KW, willow Overhanging veg, down wood, few large rocks, |
| 1227 | 129= 723348 593409 | 128-129 | | Conrail Lynnhurst bridge = 20:10 | Mixed/Riprap | Same as above LWD, logs, roots, branches Snags shr/under cont'd = katapra, ash?, AA, weeping willow |
| | | | | | | trees cont'd = maple, locust |
| 1235 | 1302 722879 592710 | 129-130 | | | Mudflat | Riverside Park just downstream of boat ramp Canada Geese on mud |
| | 131= 721564 592338 | 129-131 | | | Mixed | Overhanging veg, LWD, down trees, snags FOR - same list above large rocks |

Park = Not many shrubs, pockets of shrubs understory
Tot 11

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|---------------|--|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|---|
| 1242 | | 130-131 | | | Mudflat | large rocks, LWD, overhanging veg, down trees pockets of phrag above, large patch at wazi (100m long) |
| | 1322 720440 592244 | 131-132 | DE JESSA = 30:30 | | Riprap/ Mixed | Narrow band of trees = all locust steep banks shrubs pockets = JAP KW |
| | 133= 719853 592214 | 132-133 | WP 133 = 37:30 | | Bulkhead | NOV 18 |
| | 134 = 719169 592223 | 133-134 | WP 134 = 39:00 | | Riprap/ Mixed | Sparse trees (locust, cw) + shr (JAP KW, katalpa) |
| | 135= 717572 592054 | 134-135 | WP 135 = 43:54 | | Mudflat | kingfishers LWD, Rocks, overhang, dammed, snags EGRET |
| | 137= 716697 592318 | 134-137 | | | Mixed | For = AA, cw, willow, locust shr = small pockets = AA, locust, willow small patches Herb = PL, ragweed, yellow water (ragwort?) |
| | 136 = 717060 592213 138 = 716395 592414 | 136-138 | WP 136 = 45:35 | | Mudflat | wide mudflat w/ patches of aeg. plants |

137

46:40

Patch of Phrag under powerlines
8 of 11

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|---------------|--------------------------|--------------------------------------|--|-----------------------------|------------------------------------|---|
| | 139= 716147 592423 | 137- 140 141 | WP141 = 57:35 | | Mixed/ Riprap ↓ | Fore = CW, same tree spp as above Shrub = LWD, shr = willow, AA |
| | 140= 713685 591013 | | PVSC Boat ramp = WP139 648:35 WP140 = mudflat, small | | ↓ | trees cont'd = patch of elms, CW, locust, maple patches of JAP Kw, AA, elm Rat, duck = wildlife |
| | 141= 713241 590714 | 141-142 | RTF | | Riprap/ mix | Bordering park shr dom = JAP Kw line of spruces bordering park |
| | 142= 712051 590037 | 141-142 | | | Mudflat | aq plants/shore = PL, Typha, ragwort? |
| 1317 | 143= 711341 589709 | 142-143 | RTF Bridge = 01:20 END @ 01:55 | | Mixed/ rip rap | trees density increases same list of trees |
| 1324 | | | at Kearny/Nalley Hs mudflat → covered | Boat Club/Ramp 09.20.10 | | |
| | | | END OF Transect | | | |

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|---------------|--------------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|--|
| 1445 | 144= 744299 598020 | 144 | ~RM16.5 04:15 | - END OF TRANSECT | Mixed Bulkhead | LB - For - CW, maples, Atr, willows down trees, cobbles, LWN |
| | | | | | Mixed | same tree + habitat features as above |
| | | | | | Mixed | RB - island - floodplain habitat maples (<u>silver</u> , norway), elm down wood, LWN |
| | | | | | | Canada Geese |
| 1455 | 145= 746119 597024 | 145 | ~RM17 7:20 - 6:25 | Fort Facel | Mixed | RB - For For - silver maple, locust, Elm, katalpa Shr - patches of JAP KW, katalpa Herb - patches of boneset, pokeweed? island + LB - For - Likely maples, same |

§§§

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|---------------|------------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|--|
| | | | | | | RB elm, syc, mostly silver maples, understory - Jap kn → catalpa |
| | | | | | | tree cont'd - CW, Norway maple Herbs cont'd - boxset, snake root, pokeweed |
| | | | | | | poison ivy |
| | WP 1414 | RM 17-17.4 | | | Mixed Both banks | Flood plain habitat Same list of trees + shrubs - dam = silver maple CW |
| | 146 = 746612 596142 | | 06:30 - 08:45 | | | Island below dam mallards, egret, geese understory/shrub = willow, catalpa, |
| | | | | | | Habitat features = down trees, CW, D, shallow shorelines, sections of sand beach, large rocks, cobbles - |
| | | | | | | Snags, islands |

END of Transect

LPRSA Habitat Identification Survey Form

Date: 09.22.10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature: 70s
 Surveyor(s): MW, TD, JR, GM Time and height of low and high tides: Hi @ 0830
 Starting point location (bank, landmarks): 2nd River End point location (bank, landmarks): Saddle River Arcola Pool Site

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|---|---|---|--|---------------------------------|--|
| 0835 | Second River Belleville Site WP147 - | | (Note: this is Second R. Passaic Site) TAPE 08:45 - 09:40 - end of transect | | | Riverside site - park w/ walk along river |
| | 709883 587505 | | | | | LB - Bulkhead w/ building above. RB - Bulkhead w/ River walk above |
| | | | | | | LB - willows, AA, Jap knw RB - Row of willow oaks, ornamental cherries along on top |
| | | NOTE: (THIS IS Second R. Belleville Site) ↓ | | | | Habitat notes: the walk downed wood in stream, cobbles minimal overhanging veg. |
| 0852 | Second River Bloomfield Site WP148 - | 711691, 584665 | | LB & RB Bulkhead, cobbled river bottom along both banks - trees: Scarlet Oak, Elm, Sycamore, cherry trees | | |

TAPE = 09:40 - 11:00

Mixed Veg →

Understory = planted cherry trees,
 top of bank = small cherry trees 1 of 9
 grass, walkway

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|--|--------------------------------------|-------------------------------|---|---------------------------------|-------------------------------|
| 0921 | Second River Mills Site (This is Second R. Bloomfield Site) | WP149: - coordinates | | - LB + RB of stream = bulkhead, sandy cobble substrate - some overhanging vegetation - maintained lawn on top of Left bank (at bridge) | | |
| | 712930 578530 | recorded close to target site | | - Morris Canal Site Both sides - larger trees canopy - maple (Norway), sycamore, Black locust LB surface - sparse shr/ herb layer - grass, small maples | | JACKW, ivy |
| | | END - 12:05 | | - at coordinates - access road/parallel to stream on LB (WP149) looks like active dogwalk on RB, residences, seeded backyards | | |
| 0445 | Second River Watsessing Park | WP150 | | - LB = Bulkhead/steep bank - RB = Bulkhead - cobble, gravel, sand substrate | | |
| | 712473 575414 | start tape: 12:10 end tape: 13:30 | | - overhanging veg, concrete debris, large rocks - just downstream of rail bridge | | |
| | | | | - For canopy = predom closed Elm, Norway maple, Scarlet oak Shr/shrub/understory = small maples, JACKW, small elm. | | |
| | | | | - concrete pathway is parallel to RB | | |

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|---------------|----------------------------|--|-------------------------------------|---|------------------------------------|-------------------------------|
| 10/15 | Second River Mills site | | | - Just under bridge, upstream of bridges - steep banks but no bulkhead | | |
| | WP151 = | TAPE: 13:35 start | | | | |
| | 717467 573140 | 14:55 end | | - LB - steeply descends from residences at top of bank (~150' above) Both { large canopy trees = Norc Maple, Scarlet Oak, locust banks } - sparse understory = small elm trees, JAR KN, maple | | |
| | | | | - Substrate = cobble, gravel, sand, - debris (garbage), concrete debris | | |
| | | | | - some overhanging veg - not dense - some LWD, SA mostly small branches | | |
| | | | | - Robins | | |
| 10/11 | WP152: 709256 569945 | Second River Wingham Brook TAPE: START - 15:00 END - 15:55 | | - Just downstream of N Park St, bridge on St. - Bulkhead on both banks - RB - grass/lawn | | |
| | | Gray Catbird | | - large ash on lawn - LB - sparse smaller trees - maples, katalpa, ash, AA - fence along LB | | |

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|---------------|---|---|-------------------------------------|--|--|-------------------------------|
| 1110 | Third River WP153: | Clark Pond Site (Country Club) START TAPE = 10:00 END TAPE = 11:55 | | - @ Bridge on Road - Looking downstream | | |
| | 722752 577289 | | | - at coordinates - the - Fox - maple ash | - Mixed Veg (noe way, silver) | shallow banks |
| | Note: this is the Glen Ridge Country Club site | | | - Downy woodpecker - understory - | Rose (multiflora), Snakeroot, small maples, viburnum (arrowwood) | jewelweed |
| | | | | - substrate - sand - LWD on banks, concrete debris in water | | |
| 1134 | WP154: 719920 577318 | START TAPE: 17:00 END TAPE: 18:30 | JFK Parkway Site (Third River) | - bulkhead both banks - canopy trees - Elm, maple - understory - All JAP KW | | |
| | | | | - substrate - large cobble, silt/sand - ducks, geese - park - surrounding brook upstream | | |
| | | | | on RB & downstream LB downstream - fenced shoreline, businesses. | | |

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|---------------|---|--|-------------------------------------|--|------------------------------------|-------------------------------|
| 1206 | WP155: 718049 579688 | start tape = 18:35 end tape = 19:55 | | - RB - at edge of parking lot in apartment complex - canopy trees - ^(red) Maple, oak, ash, silver maple | | |
| | <u>Third River Forest Hills Field Club</u> * can't get to actual point due to fence/gate | | | - understory = honeysuckle (tall) JAP KW - snag - cherry tree | | |
| | | | | - lawn leading up to veg - steep banks + bulkhead (small section) | | |
| 1232 | WP156: 725633 580481 | <u>3rd River Clarks Pond</u> | | - LB - edge of ball fields - appears planted w/ riparian veg - path along shoreline | | |
| | | START TAPE: END TAPE: 21:00 | | - pond lots is dammed - Canada Geese | | |
| | | | | - shoreline veg = reeds, typha, thistle, duckweed, PL, in water = lot Smartweed, lady's thumb, polygonum, goldensrod (in water) | | |
| | | | | pink + common (white) Smartweed RB - trees - closed canopy, some overhang veg + LWD too far to distinguish spp - likely maples | | |

name's Rocket² - yellow

5 of 9

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|---------------|----------------------------|--|-------------------------------------|-----------------------------|--|-------------------------------|
| 1311 | WP157: 734445 578445 | 3 rd River Bansal Wildlife Preserve | | Mixed | LB — Ash, maple, — steep bank, up to residences, not much understory growth on slope. | |
| | | START TAPE = 21:05 END TAPE = 22:05 | | | — small path on LB side | |
| | | (at bridge) | | | RB — canopy trees — ash, maples, — understory — JAPKW, spicebush small creek coming in on RB | |
| | | | | | substrate — cobble, gravel, sand wide streambed | |
| | | | | | small branches = wood debris overhanging r.g. wide streambed, riffles, small pools | |
| | | | | | few large trees down on bank. exposed roots | |
| | | | | | | |

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|---------------------------------------|---|--|--------------------------|--|-------------------------------|
| 1413 | WP158: 727443 591276 | 3 RD River Clifton Pond Site (at bridge on road) behind fence - near Costco (R/S) | | | LB - steep banks, JAP knw RB | |
| | 727406 592297 | Start tape: End tape: 23:10 | - R13 on LB, other side of commercial prop | | LB - sparse tree cover RB - dense, but narrow strip of tree cover Tree = ^{Red} maple, oak (scarlet?) katalpa, willow, syc | |
| | | | | | Site = multiflora rose, poison ivy | |
| 1511 | WP159: 738945 | Third River Mouth Saddle River Oxbow Site behind fence in apartment | | | steep banks canopy - ash, locust, cw, willow, maple sparse understory - poison ivy | |
| | 601902 | start: FAPE start: end: End: 23:15 24:15 | | | sparse WD, large rocks on shoreline (riprap?) some Branches down | |
| | | could not get access behind fence | | | | |
| 1528 | WP160: 741030 603503 | Saddle River Felician College South start: end: 25:20 | Forested | | - Gr. Catbird, mallards - trees → syc., locust, Silver Maple, elm - Understory = sparse - poison ivy, AA, patches of snake root - down wood - small branches - substrate - cobbles, gravel Sandy bare on RB | |

behind fence at edge
of OBA Hall parking lot
private - spoke to security for permission

7 of 9

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|---------------|------------------------------|---|-------------------------------------|-----------------------------|------------------------------------|---|
| 1541 | WP161. 741.365 604.476 | Saddle River Lodi Cemetery (close to the spot, approx 200ft downstream on private college/cemetery property) opposite Lodi DPW garage | | | | - steep banks - sparse trees at edge of cemetery Red maple, cherry, scarlet oak (Red?) Hickory very few shrubs - shakeroot + JAP KW; some ornamental shrubs - large patches of JAP KW |
| | 300ft from target | | | | | - cemetery grass - silt/sand bottom - lots of debris, tires, not much LWD - saw several carp, few bass - Robins, Gr Catbirds |
| | | start: 25:25 END: 26:50 | | | | |
| 1746 | WP162; 771.618 602.481 | Saddle River County Park Site start: 20:55 end: 29:40 | | | | - substrate - soft, mud, sand, some cobbles - JAP Knotweed = almost 100% - MAPLE, ash = 2 trees on shoreline - down trees, branches |
| 1810 | WP163. 767.076 604.609 | Saddle River Arcola Pool Site start: 27:45 end: 29:15 | | | | - large pool site - man-made pond/pool? - sand substrate - large patches of phragmites |

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|---|-------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|---|
| | | Saddle River Arcola cont'd | | Pool Site | | <ul style="list-style-type: none"> - weeping willow, few AA - ragweed? - in water - large concrete structures |
| | | | | | | <ul style="list-style-type: none"> - larger canopy trees bordering the site, likely maple, ash, willow |
| <hr/> <div style="text-align: center;">END OF SURVEY FOR 09.22.10</div> | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

LPRSA Habitat Identification Survey Form

Date: 09-23-10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature: Low 70s
 Surveyor(s): MW, TD, S.O. Hare Time and height of low and high tides: 9:00 @ Hi, 3:10 @ Lo
 Starting point location (bank, landmarks): Third River Mouth Site End point location (bank, landmarks): Third R. Mouth Site

Habitat Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Habitat ^c |
|-----------|-----------------------------|------------------------------------|--|--------------------------|--|-------------------------------|
| 0827 | WP 164: 725002 593845 | TAPE START: 29:20 End: 30:30 | THIRD RIVER MOUTH SITE (200' downstream of | | - LB - For + scr/site - overhanging veg. | |
| | | | mark because can't access shoreline at mark) | | - RB - paved, fenced walkway (planted) - scr/site - JAP KW, AA, privet - elm | along riverwalk |
| | | | | | LB - tree → maple, willow, syc, locust, elm, <u>ew</u> LB - understory - willow | |
| | | | | | LB - virginia creeper? LB - overhanging veg, small branches down | |
| | | | | | ← can't see substrate of river | |

End of transect

HUMAN ACCESS/EXPOSURE IDENTIFICATION SURVEY FORMS

West Bank

Sheetpile/ Bulkhead, RipRap, Vegetation, Concrete

Thai is taking note of shore line transects.

Quality Assurance Project Plan
Addendum Number 3
Lower Passaic River Restoration Project

Surface Sediment Chemical Analyses and Benthic Invertebrate
Toxicity and Bioaccumulation Testing
Revision Number: 0
Revision Date: 09/08/10

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/20/10 8:30 AM Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature: 65° F
Surveyor(s): M. DUGAS + WINOWARD (T. DO, M. WELSH) Time and height of low and high tides: ~~low~~ high tide
Starting point location (bank, landmarks): CP6 Dock End point location (bank, landmarks): Hampton Inn

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

09/20/10
West Bank

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------------|--------------------------------------|-------------------------------------|--|------------------------------------|---|
| 8:30 | 73417.29N 597036.39E | CP6 Dock Ref Point | # 24457 | Begin Video. | Bulkhead w/ Vegetation | None on W. Bank (~4ft to water) CP6 Boat Dock on E. Bank |
| 8:54 | 734004.94N 596938.07E | | | | Concrete w/ Vegetation | Concrete slope ~ 35° Bridge above on A |
| | | | | | w/ a little bit of rip rap | Small patch of riprap w/ scattered rubbish. No visible sediments |
| 8:57 | 733838.16N 596876.55E | | | | Steel bulkhead Cement B.H. mix | Road directly above bulkhead. (guard rail) |
| 9:08 | 732194.93N 596597E | Bridge | # 2443 | | Bulkhead turns to riprap | No human access Mixed vegetation overhanging |
| 9:15 | 731816N 596471E | Union St Bridge | # 2458 # 2459 | Small clearance for access thru veg. noted just upstream of bridge | | <u>ROVER noted on water 9:14am</u> just below bridge |

- ^a Record notes on location of coordinates (e.g., approximate boundary of upstream or downstream end of shoreline category, landmarks).
^b Aquatic vegetation, mixed vegetation, bulkhead, or riprap.
^c Notes on human access/exposure may include:
- Characterization of accessibility of shoreline, such as the presence of fencing, buildings, infrastructure, or other features that may affect access
 - Characteristics of shoreline and intertidal areas, such as slope and substrate/composition, size of intertidal area at low/high tides; for bulk-headed shoreline, distance between top of bulkhead and river at low/high tides
 - Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
 - Evidence of human use or activities, including type of activity observed (e.g., fishing, boating), established paths/trails to or along shoreline, abutting residential properties with steps/access to shoreline
- Went to bridge + turned
ground
downstream

1

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/20/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--------------------------------------|-------------------------------------|--|------------------------------------|---|
| 9:20 | — | — | — | → shoreline changes frequently from steel bulkhead/concrete/riprap w/mixed vegetation overhanging | | |
| 9:23 | 731483N 566261E | — | # 459 460, 461 | lawn chair above bulkhead | Steel B.H. | No access to river ~5 ft from water Worn foot path from road to top of bulkhead Localized trash near chair (bag of trash) |
| 9:36 | | — | 462 463 | 2nd chair also noted near 1st chair | | |
| 9:37 | 730795N 596033E | — | 464 465 | Culvert Localized trash | | Steel Cement + B.H. Worn path |
| 9:39 | 730623N 595782E | — | 466 467 | Localized trash | riprap/ mixed veg. | access to water through riprap Some fencing |
| | — | — | — | junkyard/storage facility on land above. presence of tractor trailers shoreline becoming more riprap/mixed veg. | | |

^a Record notes on location of coordinates (e.g., approximate boundary of upstream or downstream end of shoreline category/landmarks).

^b Aquatic vegetation, mixed vegetation, bulkhead, or riprap.

^c Notes on human access/exposure may include:

- Characterization of accessibility of shoreline, such as the presence of fencing, buildings, infrastructure, or other features that may affect access
- Characteristics of shoreline and intertidal areas, such as slope and substrate/composition, size of intertidal area at low/high tides; for bulk-headed shoreline, distance between top of bulkhead and river at low/high tides
- Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
- Evidence of human use or activities, including type of activity observed (e.g., fishing, boating), established paths/trails to or along shoreline, abutting residential properties with steps/access to shoreline

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/20/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--------------------------------------|-------------------------------------|--|---|---|
| 9:47 | 729610N 596421E | 468 | 469, 470 | | Shoreline remains R/R mixed veg. | Boat present on small dock/walkway into water. Junkyard above. |
| 9:52 | 728060N 596911E | | — | | Shoreline turns back to bulkhead w/ overhanging veg. | No human access. |
| 9:58 | 727182N 596919E | | #471, 472 | CSO. Not flowing ~10ft to water | Nearing Nereid Boat Club on East Bank. Bulkhead | |
| 10:05 | 726432N 596661E | | #473, 474 475 | cement B.H + mixed veg below bridge | | No human access; alongside road. |
| 10:08 | 724906N 596069E | R43 Bridge | #476, 477 | | | |
| 10:11 | 724751N 595966E | | | | | Boat present on water. Spotted at Union St Bridge Shoreline turning back to rip rap/mixed veg. |

^a Record notes on location of coordinates (e.g., approximate boundary of upstream or downstream end of shoreline category, landmarks).

^b Aquatic vegetation, mixed vegetation, bulkhead, or riprap.

^c Notes on human access/exposure may include:

- Characterization of accessibility of shoreline, such as the presence of fencing, buildings, infrastructure, or other features that may affect access
- Characteristics of shoreline and intertidal areas, such as slope and substrate/composition, size of intertidal area at low/high tides; for bulk-headed shoreline, distance between top of bulkhead and river at low/high tides
- Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
- Evidence of human use or activities, including type of activity observed (e.g., fishing, boating), established paths/trails to or along shoreline, abutting residential properties with steps/access to shoreline

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/20/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--------------------------------------|-------------------------------------|--|---|---|
| 10:15 | 724418N 595684E | | #479 | exposed mudflat | | mixed vegetation/riprap bounded by road. No human access |
| 10:16 | 724236N 595462E | | #480 481 | Conrail Lyndhurst Draw Bridge | | riprap/mixed veg below bridge on both sides. Also, end of mudflat area |
| 10:17 | 724142N 595292E | 724062N 595105E (END) | #482 | Beginning of another mudflat. Transitions back to R.Rap | | Bounded by mixed veg/riprap + road. No human access. |
| 10:21 | 723955N 594488E | | #483 484 | Confluence w/ ~ RM: 11.25 3rd River | | |
| 10:32 | 723601N 593403E | | | | Continuing stretch of current B.H. mixed veg on top. | |
| 10:34 | 723430N 593033E | | #485 484 | exposed mudflats. | gutter flox w/ mixed vegetation on top | |

^a Record notes on location of coordinates (e.g., approximate boundary of upstream or downstream end of shoreline category, landmarks).

^b Aquatic vegetation, mixed vegetation, bulkhead, or riprap.

^c Notes on human access/exposure may include:

- Characterization of accessibility of shoreline, such as the presence of fencing, buildings, infrastructure, or other features that may affect access
- Characteristics of shoreline and intertidal areas, such as slope and substrate/composition, size of intertidal area at low/high tides; for bulk-headed shoreline, distance between top of bulkhead and river at low/high tides
- Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
- Evidence of human use or activities, including type of activity observed (e.g., fishing, boating), established paths/trails to or along shoreline, abutting residential properties with steps/access to shoreline

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/20/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--------------------------------------|-------------------------------------|--|------------------------------------|---|
| 10:39 | 721025N 592093E | 485 | #486 | Nutley Boat Ramp | | Fencing around boat launch area. |
| 10:40 | 720909N 592071E | 487 | #488, 489 | Homeless shelter camp open area/concrete pier | | |
| 10:43 | 720627N 592049E | | DeJesse Bridge #490 | | | Crosses water. |
| 10:53 | 718840N 591826E | East Bank | #492 491 | Two people standing on dock at Passaic River Boat House | | West Bank shoreline continued to be cement B.H. |
| 10:56 | 717516N 591889E | | #493 | Bulkhead bordered by cement steel | | Access to water for fishing from B.H. No lawn chairs present (visible) |
| 11:00 | | | #494 | fencing present above bulkhead for a stretch ~ RM: 9 | | (see video) |

^a Record notes on location of coordinates (e.g., approximate boundary of upstream or downstream end of shoreline category, landmarks).

^b Aquatic vegetation, mixed vegetation, bulkhead, or riprap.

^c Notes on human access/exposure may include:

- Characterization of accessibility of shoreline, such as the presence of fencing, buildings, infrastructure, or other features that may affect access
- Characteristics of shoreline and intertidal areas, such as slope and substrate/composition, size of intertidal area at low/high tides; for bulk-headed shoreline, distance between top of bulkhead and river at low/high tides
- Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
- Evidence of human use or activities, including type of activity observed (e.g., fishing, boating), established paths/trails to or along shoreline, abutting residential properties with steps/access to shoreline

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/20/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|---|-------------------------------------|---------------------------------------|------------------------------------|--|
| 11:02 | 714096N 591092E | | #495 | Cement block out in river | Continue to cement B.H. | transitions to steel B.H. before Rt. 7 Bridge |
| (25) 11:06 | 711954N 589792E | Rt. 7 Bridge | #497 498 | | Rip rap in both sides of bridge | Scattered trash on bank from river. |
| 11:10 | 711446N 589554E | RM 28.5 | 500 499 | Exposed sed w/ rocks below steel B.H. | | No human access. west Floating Dock West Bank has Kearny Boat Launch |
| (29) 11:16 | 709322N 589462E | | Confluence w/ 2nd River #501 | | | East |
| 11:17 | ↓ | | #503 502 | Mudflats No human access | Cement B.H. / Bridge above. | |
| 11:22 | 708663N 588944E | Charles St. Corral W. Arlington Bridge | #505 | | Bridge bounded by cement B.H. | |

^a Record notes on location of coordinates (e.g., approximate boundary of upstream or downstream end of shoreline category, landmarks).

^b Aquatic vegetation, mixed vegetation, bulkhead, or riprap.

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- Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
- Evidence of human use or activities, including type of activity observed (e.g., fishing, boating), established paths/trails to or along shoreline, abutting residential properties with steps/access to shoreline

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/20/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|----------------------|--------------------------------------|-------------------------------------|--|------------------------------------|---|
| 11:24 | 707712 N 588637 E | | #506 | Exposed mudflats. w/rocks ⇒ Continued (see video) | | No human access. Bounded by Cement B.H. |
| (34) 11:30 | 705735 N 587167 E | Marina | #508, 509 510, 511, 512 | Boat skimmer + 2 personal boats in water, anchored. Boats tied up on shore + 1 seadoo tied up on shore. | | Steel B.H. + riprap on shoreline |
| 11:33 | 704612 N 586943 E | | 513 514, 515 | Boat launch @ marina (#514) picnic table @ factory | | Fencing present. Only for use for factory workers. No fencing. Cement B.H. Old factory. ~5 ft to water |
| 11:37 | 703646 N 586427 E | E. Bank | Kenny Boat ramp. 516 | → fishing. Line in water. 1 person present on ramp. Ramp is approx 6 ft to water | | |
| (35) 11:38 | 703187 N 586062 E | Newark | Asphalt + Paving #517, 518 | | Bulkhead continues. | |
| | ↓ | | 519, 520 | Picnic table outside on B.H. | | |

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West Bank

* mudflat extent
noted on video

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/20/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--------------------------------------|-------------------------------------|---|------------------------------------|--|
| 11:42 | 701253N 585092E | | #521 | | Bulkhead | Shoreline transitioning to more industrial/ Brownfields. Some scattered signage |
| 11:44 | 700466N 585021E | | #522 | Homeless camp above cement B.H. Tent setup b/w 2 old trailers. | | 2 people sitting underneath. Set back about 30ft from water edge |
| 11:46 | 700637N 585011E | Abandoned Railroad Bridge | #523 | | | Bridge raised |
| 11:47 | 699610N 584934E | | #524 | Parking lot w/ "No Docking" sign | | |
| 11:47 | 699112N 584868E | | #526 | Picnic area. 3 people outside. | | Fencing. parking lot |
| 11:48 | 698770N 584794E | Union St. Bridge | #527 | Bridge + 2 ppl walking on sidewalk of bridge | | |

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Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/20/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--------------------------------------|---------------------------------------|--|------------------------------------|---|
| 11:50 | 697984N 584676E | Bridge humans | # 528 529, 530 | Industrial area | Bulkhead | Human Access Point. That has seen people down here below bridge. Scattered litter. |
| | | 2nd bridge right next to 1st bridge | # 531 (ladder), 533, 534 | | " | Newark Harrison Bridge # 534 Hampton Inn (East) |
| | | Bk | 535 536. | Parking lot | | |
| 11:57 | 696600N 584653E | Bridge + Bridge | # 537, 538 539, 540, 541, 542, 543 | Fencing, parking lots. | Bulkhead | |
| 12:02 | 694894N 585118E | | 544, 545, 546 | Homeless camp. Human Access to water over rip rap. | | Localized Trash present |
| | | | STOP FOR LUNCH | | | NTPAC visible in background |

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→ West Bank
Conid

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/20/10 Weather: (Sunny) Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s): M. O'Kearney + W.W.

Time and height of low and high tides:

Starting point location (bank, landmarks): Hampton Inn

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--------------------------------------|-------------------------------------|---------------------------------|------------------------------------|--|
| 12:45 | 694772N 585164E | | #547 | | Steel bulkhead. | ~10 ft to water. No fencing. NJ PAC |
| 12:47 | 694530N 585212E | | #548, 549 #550 (short line) | Exposed mudflat | Cement B.H. | ~10 ft to water. No fencing . Small patch of fencing (FBI building on shore) |
| 12:50 | 693322N 585189E | Amtrak Bridge | #551 | | Bulkhead. | Parking lot on W. Bank. Fencing along B.H. in parking lot. |
| 12:53 | 692226N 587607E | Jackson St Bridge | #552, 553 554, 555 | (other side of bridge) | | Human Access point or drainage culvert? Stairs, fencing. See photos. |
| | | | | Mudflats start on other side of | Bridge St Bridge | |
| 12:57 | 692303N 588719E | | 556, 557 | 1 person present. | | Worn foot path down to home base camp. Local trash. |

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Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/20/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--------------------------------------|-------------------------------------|---|------------------------------------|---|
| 1:00 | 692448N 590023E | | #558 | Concrete block outstretching shoreline. | Localized trash. | |
| 1:03 | 692943N 590638E | | #559, 560, 561 | Riprap. Some exposed sed @ low tide | Steel bulkhead | 2 trailers present above B.H. Some fencing |
| 1:06 | 693460N 590913E | | #562, 563 | Riprap. patch through steel B.H. | | Some localized trash, industrial area + fence Possible access to water down R.R. slope |
| 1:09 | 694197N 591315E | | #564, 565 | Tractor trailer parking lot | Bulkhead. | No fencing. |
| 1:10 | 694365N 591431E | | #566, 567, 568, 569 | Mudflat begins. | B.H./R.R. mix | Some access to mudflat @ low tide industrial area, broken section of B.H. |
| | ↓ | | | Mudflat continues but fencing begins to reduce potential for access. Steel bulkhead becomes predominate of shoreline feature | | |

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Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/20/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|----------------------|--------------------------------------|-------------------------------------|---|------------------------------------|--|
| 1:17 | 695051 N 592777 E | | #570 | Continues to be a primarily industrial/ commercial area | B.H w/ fencing | Potted Plants beyond fencing. |
| 1:20 | 695105 N 593349 E | Diamond Alkali Site | #571, 572 573 | | B.H./R.R. mix | some fencing junkyard/storage area. mudflat begins below bulkhead |
| 1:24 | 695173 N 594387 E | | #574, 575 576 | | R.R. down to water | Fencing present. Mudflat around corner of R.R. bend |
| 1:29 | 695309 N 591999 E | Old Passaic Yacht Club | #577-580 581 | | R.R. down to water | Nx fencing. Mudflat present |
| 1:32 | 695313 N 595971 E | Turnpike Bridge | #582, 583 584, 585 | | Riprap. some fencing | Phragmites on mudflat under bridge. <u>Workers are working on bridge</u> |
| 1:38 | 694670 N 597678 E | | #586 | | Bulkhead. | Storage yard w/ fencing <u>1 worker outside</u> |

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Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/20/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|----------------------|--------------------------------------|-------------------------------------|---|------------------------------------|---|
| 1:41 | 694162 N 598123 E | | #587 | Mudflat | Mixed veg/B.H. | w/ fencing. Access restricted by fencing. |
| 1:44 | 693030 N 598108 E | Alaska Skyway Bridge | #588, 589 | Mudflat continues under bridge | ↓ | Parking lot under bridge presence of a few tractor trailers too. |
| 1:45 | 692063 N 597978 E | Thick 109 Bridge | #590-592 593 | | R.R./B.H mix | |
| 1:48 | 691443 N 597831 E | | 594, 595 | Tanks on shore Storage yard. | R.R./B.H mix | |
| 1:50 | 691032 N 597732 E | Former Geddy terminal | 596, 597 598-600 | Mudflat begins Portfield area | R.R./B.H mix | Fencing to block off parking lot No R steps coming from white building |
| 1:54 | 689826 N 597386 E | | 601, 602 | 3 chairs next to a boat above rip rap bank. | R.R. | |

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1:58 687377 N
596799 E #603 New Shoreline

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/20/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|--------------------|----------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|--|
| 1:59 | 687097 N 596738 E | | #604, 605 | Boat + 1 person | Bulkhead. | Small dock + path leading from a parking lot |
| 2:01 | 685640 N 596824 E | | #606, 607 | | | Port area where B.H. |
| ⑫ 2:03 | 684374 N 596863 E | Passaic Savage Authority | 608 | | | Dock w/ sm. boat. |
| ← END OF W. BANK → | | | | | | |
| | | | | | | |
| | | | | | | |

STARTING
E. Bank
(see pg. 15)

^a Record notes on location of coordinates (e.g., approximate boundary of upstream or downstream end of shoreline category, landmarks).

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EAST BANK. → heading back
upstream

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/20/10 2:06 PM Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature: ~72°F
Surveyor(s): M.D. + W.W. Time and height of low and high tides: low tide at present
Starting point location (bank, landmarks): Algon End point location (bank, landmarks): low tide @ 2 P.M.

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|---|-------------------------------------|-----------------------------|--|---|
| 2:09 | 685896N 589620E | Kearny Pt. | #609, 610 | | Vegetation R.R. mix | Tent setup on bank. Localized trash. R.R. down to water's edge |
| (15) 2:18 | 688231N 577221E | | #611 | | | Steps down to raised wooden platform next to an old tanker/barge |
| | | Majority is bulkhead w/fencing. Scattered parking Not a high chance for human access here. | | | | lots in an industrial-use zone. |
| 2:26 | 693394N 598311E | | #612 | | Cement slope's hummocked by B.H. | Load/unload cargo - boat launch (old one?) Cement slope down to water. |
| | | Shoreline transitioned into riprap (see video). | | | | |
| 2:31 | 694943N 597845E | | #613, 614 | | | Boat dock w/rusty ladder to water |

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2:30 695281N #615 Steps leading down to R.R. shoreline
597312E Beside bridge

DRAFT

E. Bank
cont'd

Quality Assurance Project Plan
Addendum Number 3
Lower Passaic River Restoration Project

Surface Sediment Chemical Analyses and Benthic Invertebrate
Toxicity and Bioaccumulation Testing
Revision Number: 0
Revision Date: 09/08/10

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/20/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Mudflats are
fenced off for
human access.

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--|-------------------------------------|-----------------------------|------------------------------------|---|
| 2:34 | 695515N 596442E | #615 | | stairs to shoreline | Bulkhead R.R. | Under bridge. No vegetation. |
| 2:44 | 695028N 592071E | Train tracks abutt E. Bank (Bridge) #616 | 617 | Train station/trainyard | Rip rap/Veg. | near 695028N 592071E |
| 2:47 | 694693N 591412E | # | 618 | | Rip rap w/ Veg. | Picnic table outside trainyard w/ Fencing. Mudflat begins shortly after. |
| 2:52 | 692704N 589809E | # | 619 | Mudflat ends. | Vegetation w/ R.R. | Transitions into rip/rap, rocks shoreline w/ Veg. |
| 2:55 | 692542N 588869E | # | 620 | Rip rap to mudflat | R.R/Veg. | Fencing above. Sewer opening above mudflat too. Length of mudflat appears to be fenced off. |
| 3:00 | | Jackson St Bridge E. Bank | # | 621 | Rip rap | PSEG land on E. Bank. |

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East Bank

3:07 * Note greenspace around F&B building on W. Bank (photo #623)

Quality Assurance Project Plan
Addendum Number 3
Lower Passaic River Restoration Project

Surface Sediment Chemical Analyses and Benthic Invertebrate
Toxicity and Bioaccumulation Testing
Revision Number: 0
Revision Date: 09/08/10

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/20/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|---|
| 3:02 | 69309UN 586057E | | # 622 | | RR/B.H. | Accessible mudflat beside bridge Fencing present/train tracks may limit access |
| 3:08 | 695898N 584962E | | # 624 | | RR/BH | Condos. Fencing along R.R./B.H. |
| 3:10 | 696485N 584845E | | # 625 | | R.R./Veg B.H. | Hampton Inn hotel. Benches to sit. Fencing abutts rip rap shoreline |
| 3:12 | 697269N 584787E | | # 626 627 | | R.R. | Human access pt just beside hotel Fencing separates hotel property |
| 3:14 | 697322N 584841E | 280 Turnpike Bridge | # 628 | | R.R. | Parking lot below bridge Mowed into B.H. shoreline beyond parking lot. |
| 3:17 | 697322N 584841E | | 629 | Truck parked | | |

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697322
700325 584841
585168

630, 631

Access on either side of bridge. Industrial area. Broken B.H. Fencing.
Bridge that swings up.

DRAFT

Page 36

(17)

East Bank

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/20/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|-----------|----------------------|-----------------------------------|-------------------------------|--------------------------|---------------------------------|---|
| 3:22 | 701530 N 585427 E | | #632, 633 | | R.R/Veg | No trespassing sign just downstream of Marshalls. Access to shoreline, no visible fencing |
| 3:24 | 702325 N 585739 E | | #634 | | B.H./R.R. | Walkway outside Marshalls above bulkhead. Fencing present. Some benches. |
| 3:26 | 703061 N 586292 E | Kearny Carwash | #635, 636 | | B.H./R.R. | Applebees + Carwash |
| 3:28 | 703303 N 586464 E | Kearny Boat launch | #637-639 | | R.R. | Boat launch. Kearny. Gate open. Cement boat launch + small walkway. No people present |
| 3:30 | 704760 587186 | Across from marina W. Bank | #640, 641-644 | | Veg/R.R. | Parkland. parkland also present downstream. Hard to see from water. No fencing. Some exposed sed. |
| — | — | — | — | — | — | No barriers to prevent human access. See video. Riverbank Park |

^a Record notes on location of coordinates (e.g., approximate boundary of upstream or downstream end of shoreline category, landmarks).

^b Aquatic vegetation, mixed vegetation, bulkhead, or riprap.

^c Notes on human access/exposure may include:

- Characterization of shoreline, such as the presence of fencing, buildings, infrastructure, or other features that may affect access
- Characteristics of shoreline and intertidal areas, such as slope and substrate/composition, size of intertidal area at low/high tides; for bulk-headed shoreline, distance between top of bulkhead and river at low/high tides
- Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
- Evidence of human use or activities, including type of activity observed (e.g., fishing, boating), established paths/trails to or along shoreline, abutting residential properties with steps/access to shoreline

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/20/10

Weather:

Sunny

Partly Cloudy

Cloudy

Precipitation

Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|-----------|----------------------|-----------------------------------|-------------------------------|--|---------------------------------|---|
| 3:37 | 707586 N 588762 E | Rapp's Boat Yard | #645-648 | Human access point | Surrounded by riprap | 5 Boats in water + Dock 4 Boats on land |
| 3:41 | 710437 N 589521 E | Kearny Rowing Club | #649, 650, 651 | | R.R. River | Parkland above w/ fencing |
| 3:45 | 710026 N 589600 E | | #652-654, 655, 656, 658 | Near Arlington Diner + Route 7 Bridge | Surrounded by R.R. River | Rowing Club Ramp + Dock People present outside of club (teenagers) |
| | | | | Tape finished | | Done for day 09/20/10. |
| 4:10pm | | | #659 | 8 women rowing + 1 woman guiding in a boat | | Under Lyndhurst River bridge. |
| 4:12pm | | | #660, 661 | Another group of teenagers (female) entering water | | at dock (Lyndhurst) |

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- Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
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General observation of scattered trash all along R.R. shoreline.

Note graffiti on W. Bank on B.H. (#655)

4:20pm #662 Fisherman on bulkhead on W. Bank near bridge (1st bridge downstream of CP6 Dock)

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/21/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature: 70°F
Surveyor(s): M. DUBAS + W.W. Time and height of low and high tides: Currently high tide
Starting point location (bank, landmarks): CPG Dock on West Bank heading upstream End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|-----------|--------------------|-----------------------------------|-------------------------------|--------------------------|---------------------------------|---|
| 8:21 | 734127N 596983E | | Begin survey #001, 002 | | B.H./R.R. w/Veg | No human access. Across from CPG Dock RM13.5 #002 small clearing to water |
| | | | | | | shoreline continues - steep slope mixed veg/rocky shoreline |
| 8:29 | 735226N 597385E | | #003 | | | male single rower heading downstream |
| 8:30 | 736034N 597337E | | #004 005 | | mixed veg B.H. | stairs down from building guardrail present parking lot K+D Fuel oil |
| 8:34 | 736422N 597249E | Main St Bridge | #006 007 | industrial area | R.R. | Worn path beside bridge (or runoff/drainage channel?) R.R. slope to water |
| 8:36 | 736505N 597221E | | #008 009 | | R.R./steel B.H. | Railing present View of water. Burkerking in background |

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- Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
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Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/21/10

Weather:

Sunny

Partly Cloudy

Cloudy

Precipitation

Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|--|
| 8:40 | 737019N 597216E | | #010 011 | | Fenced B.H. | Fencing on cement B.H. 1' keepout sign PVSC Building on fence |
| 8:43 | 738016N 597422E | Dundee Canal Railway | #012 014 013 | | Cement | Homeless people have been known to live under bridge. white chair present |
| 8:46 | 738286N 597597E | | 015, 016 | | B.H. cement | Table + chairs. No fence. Junk. |
| 8:46 | 738375N 597893E | | 017 | | B.H. steel | Old mill building |
| 104 8:47 | 738443N 598253E | Bridge-2nd St Bridge | 018, 019 | | Steel B.H. | Old mill buildings + bridge Graffiti (#019) |
| 8:53 | 738039N 599244E | | 020 021 | | Mixed Veg | 2 chairs on bank. Tarped area. Parking lot to industrial property w/ trucks. |

^a Record notes on location of coordinates (e.g., approximate boundary of upstream or downstream end of shoreline category, landmarks).

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Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/21/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|--|
| 8:55 | 737574N 599340E | | #022 023 | | Mixed Veg w/rocks. | Storage yard Trucks parked. |
| 8:57 | 737289N 599339E | | #024 | | Steel B.H. w/fence | Old mill buildings on B.H. PPPC chimney stack behind building. |
| 9:00 | 736862N 599498E | | #025 026 027 028 | | Mixed Veg/B.H. No fence | Parking lot for trucks above. PPPC land 1 open truck bed facing river. Scattered trash on bank. |
| 9:03 | 736754N 600204E | 8th Street Bridge | #029 030 | | Mixed veg on both sides. | Bridge is fenced/railing. No visible access down to water |
| 9:15 | 738491N 600767E | | #031 033 032 | Industrial area | Mixed veg. | Localized trash under tree |
| 9:17 | 738625N 600789E | | #034, 035 | ↓ | Mixed veg. | Worn footpath next to drain |

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- Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
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Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 6/9/21/10

Weather:

Sunny

Partly Cloudy

Cloudy

Precipitation

Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|---------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|--|
| 9:18 | 738980N 600793 E | | #036 037, 038 | | mixed veg | Graffiti + Footpath to water End of residential street |
| 9:25 | 739232N 6007220 | | #039, 040 - 044 | | mixed veg | house. dock. chairs. 2 boats. ladder |
| 9:28 | 739573 600577 | | #045-047 | | M.V. | house. chair pigeon coop in backyard |
| 9:36 | 739841N 600396E | | #048 | | M.V. | Sitting area on bank |
| 9:30 | 740016N 600195E | | #049 | | M.V. | residential property |
| 9:31 | 740121N 60020 E | Bridge Passaic St | 050, 051 052 | | M.V. | Picnic table at building beside bridge |

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West Bank

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/21/10

Weather:

Sunny

Partly Cloudy

Cloudy

Precipitation

Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording) #061 shows some fencing along park further upstream

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--------------------------------------|--|-------------------------------|------------------------------------|---|
| 9:34 | 740173N 599842E | | #053 -060,061 | Pulaski Park | mixed veg | Parkland. 2 ramps. Footpath (060) Benches. Some portion has railing (see photos) |
| 9:38 | 741487N 599366E | Monroe St. Bridge + Walkway | #062- 064 | | mixed veg | Graffiti present. RM16. |
| 9:40 | 741728N 599172E | | #065-075 076 | Just past Monroe St Bridge | cement B.H. | Fencing. Residential property/Parkland Walkway w/lighting. Steps. Walkway to shore. |
| 9:45 | 742051N 598854E | | → end of transect. end of West Bank survey. | | B.H (cement) mixed veg. | H. Access just past cement B.H. Drop-down area to water. |
| | | | | | | |
| | | | | | | |

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^b Aquatic vegetation, mixed vegetation, bulkhead, or riprap.

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EAST BANK. → heading downstream.

080-081 - Tree photo for Maryann

Quality Assurance Project Plan
Addendum Number 3
Lower Passaic River Restoration Project

Surface Sediment Chemical Analyses and Benthic Invertebrate
Toxicity and Bioaccumulation Testing
Revision Number: 0
Revision Date: 09/08/10

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/21/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|------------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|---|
| 9:47 | 741972 N 599047 E | | #077 | | m.veg | Old Building |
| 9:48 | Monroest Bridge | | #078 | | m.veg | Residential area multi-use home beside bridge |
| 9:49 | Just D.S. of Bridge | | #079 | | cement B.H. | Fencing on bank behind veg. |
| | 740825 N 599562 E | | #82, 83, 84, 87 85, 86, 88 | | m.veg | Parking lot. Some fencing Residential area. Some graffiti |
| 9:52 | 740321 N 599757 E | | #89, 90, 91 | | m.veg | Localized trash. Some fencing above. clearing down to water. Just downstream of Passaic St bridge |
| 9:58 | 740114 N 600098 E | | #93 | | m.veg | Parking lot |

Polish
Area

^a Record notes on location of coordinates (e.g., approximate boundary of upstream or downstream end of shoreline category, landmarks).

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9:56 #92
Bikar on
Passaic St
Bridge

DRAFT

Page 36

②

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/21/10.

Weather:

Sunny

Partly Cloudy

Cloudy

Precipitation

Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|---------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|--|
| 9:59 | 739963N 600330 E | | #094, 095 | | Mixed veg | Shopping Cart. localized trash access to river |
| 10:00 | 739754N 600620 E | | #096, 097 | | m.veg | parking lot, fencing small path in front of fence |
| 10:01 | 739620N 600756 E | | #098, 099 100 | | m.v. mixed residual above | Confluence w/ saddle river Fishing spot near blue post. |
| 10:07 | 738479N 600856 E | | #101 | | Mixed veg | homes. |
| 10:08 | 738258N 600830 E | | #102, 103 104-106 | | Mixed veg/ Cobble | homes w/ junk yard steep slope to water |
| 10:13 | 737862N 600901 E | | 106-109 | | m.veg | steps. sitting area/deck home above/condos above |

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Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/21/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--------------------------------------|---|-----------------------------|------------------------------------|--|
| 10:17 | 737813N 600911E | | #110, 111, 112 116, 117 | | m. veg | 2nd set of stairs from condo decks. sitting areas. sitting next to culvert |
| 10:24 | 737090N 600648E | 8th St Bridge | #118, 120, 121 | | m. veg | ladder cond condo complex gazebo. residential area. 1 person on shore fishing 11 ft in water |
| 10:26 | 736762N 600238E | | #122 123 - parking lot on other side of bridge. fenced in. | | steel BH. | 1 person standing looking out at water |
| 10:28 | 736668N 599688E | | #124, 125 | | m. veg | fencing. one boat parked on land past fence |
| 10:30 | 737189N 599279E | | #126, 127 128, 129 → parking lot | | m. veg | parkland above |
| 10:33 | 737930N 599201E | | #130, 134 | | m. veg | H. Access. small ramp near parking lot |

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East Bank

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/21/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--------------------------------------|---|-----------------------------|------------------------------------|---|
| 10:34 | 738204N 598951E | | #135, 136 | | m. veg. | H. Access potential Flat part down by large tree |
| 10:36 | 738351N 598608E | | #137, 138 138 → with past bridge (fence present) | | m. veg. | home near water just above 2nd St Bridge |
| 10:38 | 738294 597916 | | #140-142 | | m. veg/cement B.H. | Condos. parking lot area. picnic tables behind fence. garbage can. |
| 10:40 | 738092N 597593E | | #143, 144 | | Cement B.H. | Boat ramp near condos. Residential area sign on other side of fence. |
| 10:42 | 737446N 597421E | | #145, 146 | | Cement B.H. | Exposed mudflat fence present. residential area |
| 10:45 | 736879N 597296E | | #147, 148 | | Cement B.H. | commercial business. |

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- Evidence of human use or activities, including type of activity observed (e.g., fishing, boating), established paths/trails to or along shoreline, abutting residential properties with steps/access to shoreline

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/21/10

Weather:

Sunny

Partly Cloudy

Cloudy

Precipitation

Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|---------------------|--------------------------------------|--|-----------------------------|------------------------------------|---|
| 10:47 | 736494N 597383E | | #149 | | mixed veg | restaurant patio w/ winter view |
| 10:51 | 735382N 597507 E | | #150, 151 | | mixed veg | parkland - 3 flags on shore. fence on shore. old rusty dock |
| 10:53 | 734752N 597383 E | | #152 153 | | mixed veg | condos behind fence parking area |
| 10:56 | 734221N 597172E | | #154-157 158 - CP6 Dock + parking lot | | Mixed veg Steel B.H | Fishing area → in plaza of CP6 Dock house across from fishing area |
| | | | | | | |
| | | | | | | |

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- Evidence of human use or activities, including type of activity observed (e.g., fishing, boating), established paths/trails to or along shoreline, abutting residential properties with steps/access to shoreline

EAST BANK. → heading downstream

Quality Assurance Project Plan
Addendum Number 3
Lower Passaic River Restoration Project

Surface Sediment Chemical Analyses and Benthic Invertebrate
Toxicity and Bioaccumulation Testing
Revision Number: 0
Revision Date: 09/08/10

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

09/20/10

Date: 09/21/10

Weather:

Sunny

Partly Cloudy

Cloudy

Precipitation

Temperature:

low tide @ 1:30 pm

Surveyor(s):

Time and height of low and high tides: low tide @ 2:15 am

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|---------------------|--------------------------------------|-------------------------------------|--|------------------------------------|---|
| 11:42 | 732754N 596819E | | #159,166 | can't see much from water Rutherford Memorial Park | Cement B.H. | soccer field parkland w/ picnic tables Fence protect close to CPG Dock. BBQ (coal). |
| | | | | | | |
| | | | | | | |
| | 730114 N 596392E | | #161-170 | | Mixed veg/ R.R. | benches swimming pool eating area ladder Human Access |
| | 729622N 596563E | | #171-173 174 | | Cement BH | steps life preserver Fence/flags Human access |
| 11:56 | 729162N 596746E | | 175 truck out 176-180 | MS. area | Cement BH/ R.R. | swimming pool deck picnic table |
| 11:58 | 728946N 596871E | | 181-183 | | BH/R.R. | old boat ramp (current) gated behind house fencing |

^a Record notes on location of coordinates (e.g., approximate boundary of upstream or downstream end of shoreline category, landmarks).

^b Aquatic vegetation, mixed vegetation, bulkhead, or riprap.

^c Notes on human access/exposure may include:

- Characterization of accessibility of shoreline, such as the presence of fencing, buildings, infrastructure, or other features that may affect access
- Characteristics of shoreline and intertidal areas, such as slope and substrate/composition, size of intertidal area at low/high tides; for bulk-headed shoreline, distance between top of bulkhead and river at low/high tides
- Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
- Evidence of human use or activities, including type of activity observed (e.g., fishing, boating), established paths/trails to or along shoreline, abutting residential properties with steps/access to shoreline

DRAFT

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East Bank

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/21/10

Weather:

Sunny

Partly Cloudy

Cloudy

Precipitation

Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|----------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|--|
| 12:01 | 728765 N 596954 E | | #184, 185 | | m. Veg/RR | res area muddy rocks w. low tide Park bench (185) |
| 12:03 | 728439 N 597089 E | | #186 | | R.R./Veg. | condos. |
| 12:04 | 728208 N 597085 E | | 187-189 190 | | R.R. | boat stairs chair Human access |
| 12:05 | 727910 N 597058 E | | 191-194 | | R.R./B.H | H. Access. |
| 12:07 | 727624 N 597000 E | Nereid Boat Club Marina | 195-203. | | Old B.H | Dock/ramp. H. Access to water cars w/ trailers on shore |
| 12:10 | 727390 N 597005 E | | 204 | | m. Veg | House beside boat club w/ balcony |

^a Record notes on location of coordinates (e.g., approximate boundary of upstream or downstream end of shoreline category, landmarks).

^b Aquatic vegetation, mixed vegetation, bulkhead, or riprap.

^c Notes on human access/exposure may include:

- Characterization of accessibility of shoreline, such as the presence of fencing, buildings, infrastructure, or other features that may affect access
- Characteristics of shoreline and intertidal areas, such as slope and substrate/composition, size of intertidal area at low/high tides; for bulk-headed shoreline, distance between top of bulkhead and river at low/high tides
- Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
- Evidence of human use or activities, including type of activity observed (e.g., fishing, boating), established paths/trails to or along shoreline, abutting residential properties with steps/access to shoreline

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/21/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|------------------|--------------------------------|--------------------------------------|-------------------------------------|--------------------------------|------------------------------------|--|
| 12:12 | 727061N 596946E | | #205-207 208-210 | | BH | res area Penang |
| 12:13 | 726747N 596873E | | #211-213 | | Cement BH | parkland |
| 12:14 | 726584N 596817E | | #214-229 | | RR | Boat access stairs res area abuts river |
| 12:14 | 796128N 596666E | | 230-232 | 725633N 596577E | RR shore | 1 person sitting w/ orange cooler (#233) on bench behind fence. Picnic? |
| | 725303N 596491E | Dock beside Rt 3 Bridge | | | Mixed | |
| | | | 233-239 | under bridge | Mixed | Boat launch |

^a Record notes on location of coordinates (e.g., approximate boundary of upstream or downstream end of shoreline category, landmarks).

^b Aquatic vegetation, mixed vegetation, bulkhead, or riprap.

^c Notes on human access/exposure may include:

- Characterization of accessibility of shoreline, such as the presence of fencing, buildings, infrastructure, or other features that may affect access
- Characteristics of shoreline and intertidal areas, such as slope and substrate/composition, size of intertidal area at low/high tides; for bulk-headed shoreline, distance between top of bulkhead and river at low/high tides
- Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
- Evidence of human use or activities, including type of activity observed (e.g., fishing, boating), established paths/trails to or along shoreline, abutting residential properties with steps/access to shoreline

lot of res
access points
this whole
stretch of river

DRAFT

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(13)

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/21/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|---|
| 12:25 | 723906N 595240E | | #240, 241 | | Mixed veg. | Worn foot path down from road past railing. Steep slope. |
| 12:28 | 723793N 594780E | | #242 243, 244 | | m.v./RR | 2 cars parked park benches res area/parkland gazebo (white) |
| 12:31 | 723528N 593801E | Riverside Park | #245-247 | | m.v./RR Cobbles | Fishing spot, old cobble boat ramp. Benches. Edge of Park. |
| | | → | #248-252 | | m.v./RR Cobbles | H. Access at Riverside Park. mudflat picnic No barrier to water Fake flower on shore. tables |
| 12:31 | 722904N 592727E | | #253 | | m.v./ cobbles | parkland Worn foot path |
| 12:38 | 5922512 592541 | | #254-256 | | ↓ | parkland foot paths No barriers access pts. |

^a Record notes on location of coordinates (e.g., approximate boundary of upstream or downstream end of shoreline category, landmarks).

^b Aquatic vegetation, mixed vegetation, bulkhead, or riprap.

^c Notes on human access/exposure may include:

- Characterization of accessibility of shoreline, such as the presence of fencing, buildings, infrastructure, or other features that may affect access
- Characteristics of shoreline and intertidal areas, such as slope and substrate/composition, size of intertidal area at low/high tides; for bulk-headed shoreline, distance between top of bulkhead and river at low/high tides
- Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
- Evidence of human use or activities, including type of activity observed (e.g., fishing, boating), established paths/trails to or along shoreline, abutting residential properties with steps/access to shoreline

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/21/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--------------------------------------|---|-----------------------------|------------------------------------|--|
| 12:41 | 721589N 592344E | | #257 | | m.v. phragmites | parkland access. |
| 12:42 | 721344N 592285E | | #258-260 health club King's Court → 99260. | | R.R. m.v. | access @ end of street res. area |
| 12:45 | 720263N 592240E | | #261 262 | | Steel B.H. R.R. | CSO flowing gazebo condos Apt. complex Fence benches. |
| 12:48 | 719203N 592212E | | #263 | | B.H. | old stairs down to water |
| | 718883N 592102E | | #264-65 | | m.v./cobble | parkland access |
| 12:50 | 718489N 591965E | Rowing Riverside Park South | 266, 267 268 | | m.v./cobble | |

^a Record notes on location of coordinates (e.g., approximate boundary of upstream or downstream end of shoreline category, landmarks).

^b Aquatic vegetation, mixed vegetation, bulkhead, or riprap.

^c Notes on human access/exposure may include:

- Characterization of accessibility of shoreline, such as the presence of fencing, buildings, infrastructure, or other features that may affect access
- Characteristics of shoreline and intertidal areas, such as slope and substrate/composition, size of intertidal area at low/high tides; for bulk-headed shoreline, distance between top of bulkhead and river at low/high tides
- Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
- Evidence of human use or activities, including type of activity observed (e.g., fishing, boating), established paths/trails to or along shoreline, abutting residential properties with steps/access to shoreline

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/21/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|---|
| 12:53 | 717602N 592030E | | #267, 270 | | m.v./cobble | Riverside Park South Access pt. No fence/barriers along park |
| 12:54 | 717213N 592134E | | #271, 275 | | | parkland Access pts. |
| 12:57 | 716714N 592320E | | #276, 277 | | | open area under power lines. |
| 12:59 | 716393N 592416E | | #278, 279 | | R.R.W/ veg | backyards. junk |
| 1:00 | 716291N 592412E | | #280-282 | | Steel B.H./cement B.H./RR | Boat launch - private Dock. Fences |
| 1:03 | 715762N 592231E | | #283 | | | Benches |

^a Record notes on location of coordinates (e.g., approximate boundary of upstream or downstream end of shoreline category, landmarks).

^b Aquatic vegetation, mixed vegetation, bulkhead, or riprap.

^c Notes on human access/exposure may include:

- Characterization of accessibility of shoreline, such as the presence of fencing, buildings, infrastructure, or other features that may affect access
- Characteristics of shoreline and intertidal areas, such as slope and substrate/composition, size of intertidal area at low/high tides; for bulk-headed shoreline, distance between top of bulkhead and river at low/high tides
- Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
- Evidence of human use or activities, including type of activity observed (e.g., fishing, boating), established paths/trails to or along shoreline, abutting residential properties with steps/access to shoreline

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/21/10

Weather:

Sunny

Partly Cloudy

Cloudy

Precipitation

Temperature:

Surveyor(s):

Time and height of low and high tides:

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|---|
| 1:05 | 715255N 591881E | | #284 | | RR | Open area No fencing |
| 1:06 | 715128N 591802E | | #285, 286 | | B.H (wood) | Chair deck boat ladder |
| 1:07 | 714434N 591462E | | #287, 294 | | RR/m.veg | res. area turn to park fishers - 4 ppl boat ramp/cement |
| 1:11 | 713668N 590994E | end | #295-299 | | ↓ | "One man Army" guy. boat in water, dock Euro Lounge Cafe |
| 1:12 | 713454N 590851E | | #300 | | ↓ | tiki torches + benches |
| 1:13 | 713236N 590720E | | #301, 302 | | ↓ | parkland/stadium Fencing, tree line |

^a Record notes on location of coordinates (e.g., approximate boundary of upstream or downstream end of shoreline category, landmarks).

^b Aquatic vegetation, mixed vegetation, bulkhead, or riprap.

^c Notes on human access/exposure may include:

- Characterization of accessibility of shoreline, such as the presence of fencing, buildings, infrastructure, or other features that may affect access
- Characteristics of shoreline and intertidal areas, such as slope and substrate/composition, size of intertidal area at low/high tides; for bulk-headed shoreline, distance between top of bulkhead and river at low/high tides
- Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
- Evidence of human use or activities, including type of activity observed (e.g., fishing, boating), established paths/trails to or along shoreline, abutting residential properties with steps/access to shoreline

East Bank

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/21/10 Weather: Sunny Partly Cloudy Cloudy Precipitation Temperature:
Surveyor(s): M.D + Windward Time and height of low and high tides:
Starting point location (bank, landmarks): CP6 Dock West Bank headwaters End point location (bank, landmarks): Kearny H.S. Row Club
Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/ Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|---------------|--------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|---|
| 1:16 | 712429N 590197E | | #303 304 | | m.v./R.R. | Foot path access parking lot - no fence |
| 1:21 | 711790N 589866E | Rte 7 Bridge | #305 306 | | RR/m.v/ B.H. | |
| 1:22 | 711383N 589680E | Kearny H.S. Row Club | #307-311 312, 312 | | m.v | Nutley + Kearny H.S. students See exposed @ low tide |
| | 1:24pm | | END | | | |
| | | | | | | |
| | | | | | | |

^a Record notes on location of coordinates (e.g., approximate boundary of upstream or downstream end of shoreline category, landmarks).

^b Aquatic vegetation, mixed vegetation, bulkhead, or riprap.

^c Notes on human access/exposure may include:

- Characterization of accessibility of shoreline, such as the presence of fencing, buildings, infrastructure, or other features that may affect access
- Characteristics of shoreline and intertidal areas, such as slope and substrate/composition, size of intertidal area at low/high tides; for bulk-headed shoreline, distance between top of bulkhead and river at low/high tides
- Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
- Evidence of human use or activities, including type of activity observed (e.g., fishing, boating), established paths/trails to or along shoreline, abutting residential properties with steps/access to shoreline

Attachment T: LPRSA Human Access/Exposure Identification Survey Form

Date: 09/21/10

Weather:

Sunny

Partly Cloudy

Cloudy

Precipitation

Temperature:

Surveyor(s):

Time and height of low and high tides: low tide

Starting point location (bank, landmarks):

End point location (bank, landmarks):

Human Access/Exposure Observation Log (Notes to Accompany Narrative of Video Recording)

| Date/Time | Coordinates | Notes on Coordinates ^a | Record of Digital Photographs | Notes on Video Recording | Shoreline Category ^b | Notes on Human Access/Exposure ^c |
|-----------|--------------------|-----------------------------------|-------------------------------|---------------------------------------|--------------------------------------|---|
| #1 2:40 | 744453N 598377E | | #320-323 | | Vegetation Muddy banks. Cobble | Access off of Parking lot Across from "The Venetian" Easy to cross river at low tide on foot. |
| #2 3:00 | 746152N 597008E | | #324-333 | Also access from trail | ↓ | street Easy Access. Homeless camp on opposite bank. Monument. Worn foot path. Broken glass. Trash. |
| #3 | | | 333-340 341 | Walked down trail towards Dundee Dam. | ↓ | Just beyond Dundee Dam (visible on right side) 1 person sitting in chair near tent (homeless) Localized trash. Chairs/Benches Another laying on bench (homeless) other side of river. |
| | | 2 guys parked for fishing. | | | ↓ | 2 fishermen sitting. Don't catch fish Say many ppl here do. Should post signs around this point in the river. |

^a Record notes on location of coordinates (e.g., approximate boundary of upstream or downstream end of shoreline category, landmarks).

^b Aquatic vegetation, mixed vegetation, bulkhead, or riprap.

^c Notes on human access/exposure may include:

- Characterization of accessibility of shoreline, such as the presence of fencing, buildings, infrastructure, or other features that may affect access
- Characteristics of shoreline and intertidal areas, such as slope and substrate/composition, size of intertidal area at low/high tides; for bulk-headed shoreline, distance between top of bulkhead and river at low/high tides
- Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
- Evidence of human use or activities, including type of activity observed (e.g., fishing, boating), established paths/trails to or along shoreline, abutting residential properties with steps/access to shoreline

One set of hip waders on shore

APPENDIX B: FIELD NOTEBOOK ENTRIES

09.20.10 LPRSA Habitat Identification Survey

crew: Maryann Welsch } WW
 Thai Du }
 Melissa Dugas, Aecom
 John Rolfe, dnm
 George Mohr, CDM

weather: sunny, clear, low 70's
 mod. wind

0745 Arrive at CPG Field Facility
 Meet George & John

GPS coordinates check
 @Flagpole: 733760 N 597693 E

* Discussed HSP - all have signed it
 during prior efforts except Melissa
 who has read it prior to this
 effort -
 will print off a sign in sheet when
 back at field facility (for her to sign)

8⁰⁰ depart for boat dock

8³⁰ depart boat dock

Start on LB work down
 River

12⁰⁵ stop at Hampton Inn for break

12⁴⁴ Leave Hampton - arrive spot
 where left off
 (FBI Building)

1410 START OF RB Survey @ Kearny Pt

1552 RT 7 Bridge = END of RB
 Survey
 Batteries & tapes are done

Head back to CPG facility

1630 GPS check @ Flagpole

733757 N

597687 E

MW
 09.20.10

09.21.10
 0800 - Meet at CPQ Field facility
 GPS check: 733758N
 597690E

Depart for dock

crew: Maryann Welsh WW
 Thori Do WW
 Melissa Dugas AECOM
 John Rolfe dmi
 George Mehnar DM

weather: sunny, clear, low 160's

0823 Start survey on IB opposite
 CPQ dock

1057 Stop @ Field facility for break

1143 Start at WP 120, RB

1325 Head back to field facility

1430 Depart to RM 16-17.4

1535 Finish w/ Mainstem, head
 back to field facility

1600 Entered GPS coordinates on
~~1700~~ data sheets
 END OF DAY

MMW

09.21.10

09-22-10

crew = Mangann Welsch } ww
 Thai Do
 John Rolfe dmi
 George Molnar CDM

weather: sunny, part clouds
 70's

750 Arrive field facility

0815 Depart for 2nd River

GPS check: 733957 N

@ 597692 E

Flagpole

10:05

Note - figured out 2nd River
 sites were named incorrectly
 in field notes ^{+ video} - corrected
 on field notes as follows

Named

Corrected to
~~Actually~~

2nd River Bellenille → 2nd River Passaic

" Bloomfield → 2nd River Bellenille

" Mills Site → 2nd River Bloomfield

These corrections were mentioned on the
 video prior to the River Mills site

1450 Tried to locate 3rd River Mouth
 Site

but couldn't find access on public
 land - all closed gates & fences

- will try tomorrow am - by car
 or by boat

1600 - Back at Field Facility to drop
 off George Molnar

- Call Lisa Saborn to check in

1622 Head to last 2 upper Saddle R.
 sites

1814 Finish Saddle R. sites
Head back to field facility

MW

09.22.10

09-23-10

750 Arrive Field facility

crew: Mannan, Welsh } un
Therri Do

Sean O'Hare CDM

weather: Low 70's, sunny, humid

GPS check @ Flagpole: 733759
597690

0827 Arrive Third River Mouth Site

0857 Back at Field Facility

MW 09.23.10

APPENDIX C: SHORELINE VIDEO SURVEY

Table 1. Video timestamp log for LPRSA surveyed waypoints

| Video Number | Date | Waypoint | Approximate RM | Bank ^a | Waypoint Start Time ^b | Field Notes |
|--------------|-----------|--------------|----------------|-------------------|----------------------------------|--|
| 1 | 9/20/2010 | WP1 | 13.4 | left | 0:22 | |
| 1 | 9/20/2010 | WP2 to WP3 | 13.4 | left | 1:09 | |
| 1 | 9/20/2010 | WP4 | 13.3 | left | 4:15 | |
| 1 | 9/20/2010 | WP5 | 13.1 | left | 6:44 | |
| 1 | 9/20/2010 | WP6 | 13.0 | left | 8:45 | Union Street Bridge |
| 1 | 9/20/2010 | WP7 | 12.9 | left | 10:05 | |
| 1 | 9/20/2010 | WP8 | 12.7 | left | 13:49 | |
| 1 | 9/20/2010 | WP9 | 12.2 | left | 24:44 | |
| 1 | 9/20/2010 | WP10 | 12.1 | left | 27:55 | |
| 1 | 9/20/2010 | WP11 | 11.9 | left | 29:43 | |
| 1 | 9/20/2010 | WP12 | 11.6 | left | 32:40 | Route 3 Bridge |
| 1 | 9/20/2010 | WP13 | 11.5 | left | 34:47 | |
| 1 | 9/20/2010 | WP14 | 11.4 | left | 36:20 | |
| 1 | 9/20/2010 | WP15 | 11.4 | left | 37:19 | Lyndhurst Conrail Draw Bridge |
| 1 | 9/20/2010 | WP16 | 11.4 | left | 38:20 | |
| 1 | 9/20/2010 | WP17 | 11.3 | left | 39:20 | |
| 1 | 9/20/2010 | WP18 | 11.2 | left | 41:02 | Third River |
| 1 | 9/20/2010 | WP19 | 11.1 | left | 43:00 | |
| 1 | 9/20/2010 | WP20 | 11.0 | left | 44:20 | |
| 1 | 9/20/2010 | WP21 | 10.4 | left | 52:25 | Nutley Boat Ramp |
| 1 | 9/20/2010 | WP22 | 10.3 | left | 53:50 | DeJessa Bridge |
| 1 | 9/20/2010 | WP23 | 10.2 | left | 56:20 | |
| 2 | 9/20/2010 | WP23 | 10.2 | left | 0:05 | |
| 2 | 9/20/2010 | WP24 | 10.0 | left | 2:10 | along Highway 21, under power lines |
| 2 | 9/20/2010 | WP25 | 8.8 | left | 12:30 | next to Highway 21 |
| 2 | 9/20/2010 | WP26 | 8.5 | left | 14:20 | |
| 2 | 9/20/2010 | WP27 | 8.4 | left | 15:52 | |
| 2 | 9/20/2010 | WP28 | 8.5 | left | 14:27 | Route 7 Bridge |
| 2 | 9/20/2010 | WP29 to WP30 | 8.0 | left | 19:10 | waypoints on either side of confluence with Second River |
| 2 | 9/20/2010 | WP31 to WP32 | 7.8 to 7.9 | left | 20:55 | Conrail W Arlington Draw Bridge, mudflat extends between waypoints |
| 2 | 9/20/2010 | WP33 | 7.6 | left | 23:55 | |
| 2 | 9/20/2010 | WP34 | 7.2 | left | 27:15 | |
| 2 | 9/20/2010 | WP35 to WP37 | 6.6 to 7.2 | left | 28:15 | |

Table 1. Video timestamp log for LPRSA surveyed waypoints

| Video Number | Date | Waypoint | Approximate RM | Bank ^a | Waypoint Start Time ^b | Field Notes |
|--------------|-----------|--------------|----------------|-------------------|----------------------------------|---|
| 2 | 9/20/2010 | WP38 | 6.3 | left | 34:39 | |
| 2 | 9/20/2010 | WP39 to WP40 | 6.0 to 6.1 | left | 35:26 | WP40 at Conrail Bridge-Rail Bridge, permanently raised |
| 2 | 9/20/2010 | WP41 | 5.8 | left | 38:01 | Clay Street Bridge |
| 2 | 9/20/2010 | WP42 | 5.6 | left | 39:35 | |
| 2 | 9/20/2010 | WP43 to WP45 | 5.4 to 5.6 | left | 43:12 | WP43 at 280 Bridge; WP44 at Newark/Harrison Rail Bridge; WP45 at Bridge Street Bridge |
| 2 | 9/20/2010 | WP46 to WP49 | 4.7 to 5.1 | left | 47:30 | WP49 at Amtrak Bridge |
| 2 | 9/20/2010 | WP50 to WP51 | 3.9 to 4.3 | left | 52:35 | waypoints on either side of Jackson Street Bridge |
| 2 | 9/20/2010 | WP52 | 3.7 | left | 57:30 | |
| 3 | 9/20/2010 | WP53 | 3.6 | left | 1:20 | |
| 3 | 9/20/2010 | WP54 | 3.5 | left | 2:54 | |
| 3 | 9/20/2010 | WP55 | 3.4 | left | 3:31 | |
| 3 | 9/20/2010 | WP56 | 3.3 | left | 4:27 | |
| 3 | 9/20/2010 | WP57 | 3.3 | left | 5:10 | |
| 3 | 9/20/2010 | WP58 | 3.1 | left | 6:43 | |
| 3 | 9/20/2010 | WP59 | 3.0 | left | 9:03 | |
| 3 | 9/20/2010 | WP60 | 2.9 | left | 9:39 | |
| 3 | 9/20/2010 | WP61 | 2.8 | left | 9:57 | |
| 3 | 9/20/2010 | WP62 | 2.5 | left | 11:56 | |
| 3 | 9/20/2010 | WP63 | 2.4 | left | 12:34 | Turnpike Bridge |
| 3 | 9/20/2010 | WP64 | 2.2 | left | 19:00 | Point No Point Bridge |
| 3 | 9/20/2010 | WP65 | 2.1 | left | 20:00 | |
| 3 | 9/20/2010 | WP66 | 2.0 | left | 21:19 | |
| 3 | 9/20/2010 | WP67 | 1.7 | left | 23:35 | Pulaski Skyway, ends at Morris Canal |
| 3 | 9/20/2010 | WP68 | 1.5 | left | 24:34 | Truck 1 and 9 Bridge |
| 3 | 9/20/2010 | WP69 | 1.4 | left | 25:18 | |
| 3 | 9/20/2010 | WP70 | 1.3 | left | 26:16 | |
| 3 | 9/20/2010 | WP71 | 1.2 | left | 28:00 | |
| 3 | 9/20/2010 | WP72 | 0.1 | left | 37:45 | |
| 3 | 9/20/2010 | WP73 | 0.3 | right | 38:00 | Kearny Point |
| 3 | 9/20/2010 | WP74 | 0.4 | right | 39:35 | |
| 3 | 9/20/2010 | WP75 | 0.9 | right | 50:15 | Truck 1 and 9 Bridge, end transect at upstream of barge |

Table 1. Video timestamp log for LPRSA surveyed waypoints

| Video Number | Date | Waypoint | Approximate RM | Bank ^a | Waypoint Start Time ^b | Field Notes |
|--------------|-----------|----------------|----------------|-------------------|----------------------------------|--|
| 3 | 9/20/2010 | WP76 | 1.9 | right | 51:35 | Pulaski Skyway |
| 3 | 9/20/2010 | WP77 | 2.6 | right | 53:40 | Point No Point Bridge, Pulaski Skyway |
| 4 | 9/20/2010 | WP78 | 3.1 | right | 0:33 | |
| 4 | 9/20/2010 | WP79 | 3.2 | right | 6:10 | |
| 4 | 9/20/2010 | WP80 | 3.2 | right | 6:58 | |
| 4 | 9/20/2010 | WP81 | 3.4 | right | 7:40 | |
| 4 | 9/20/2010 | WP82 | 3.5 | right | 8:26 | |
| 4 | 9/20/2010 | WP83 | 3.9 | right | 12:05 | |
| 4 | 9/20/2010 | WP84 | 4.1 | right | 13:40 | |
| 4 | 9/20/2010 | WP85 | 4.3 | right | 15:50 | Jackson Street Bridge |
| 4 | 9/20/2010 | WP86 | 4.4 | right | 16:50 | Bridge Street Bridge |
| 4 | 9/20/2010 | WP87 | 4.6 | right | 18:40 | Amtrak Bridge |
| 4 | 9/20/2010 | WP88 | 5.4 | right | 25:00 | 280 Bridge, Newark Harr Bridge |
| 4 | 9/20/2010 | WP89 | 6.2 | right | 30:45 | (old railroad) Conrail Bridge |
| 4 | 9/20/2010 | WP90 | 6.4 | right | 34:30 | |
| 4 | 9/20/2010 | WP91 | 6.5 | right | 36:05 | |
| 4 | 9/20/2010 | WP92 | 6.7 | right | 37:35 | |
| 4 | 9/20/2010 | WP93 | 7.1 | right | 38:15 | Kearny Boat Ramp |
| 4 | 9/20/2010 | WP94 | 7.4 | right | 44:10 | |
| 4 | 9/20/2010 | WP95 | 8.3 | right | 47:30 | Conrail Arlington Bridge |
| 4 | 9/20/2010 | WP96 | 8.4 | right | 52:40 | |
| 5 | 9/21/2010 | WP97 | 13.4 | left | 0:06 | |
| 5 | 9/21/2010 | WP98 | 13.6 | left | 2:52 | |
| 5 | 9/21/2010 | WP99 | 13.8 | left | 6:00 | |
| 5 | 9/21/2010 | WP100 | 13.9 | left | 6:55 | Main Avenue Bridge |
| 5 | 9/21/2010 | WP101 | 13.9 | left | 7:40 | |
| 5 | 9/21/2010 | WP102 to WP103 | 14.0 to 14.2 | left | 9:18 | waypoints on either side of Dundee Canal Raceway |
| 5 | 9/21/2010 | WP104 | 14.4 | left | 16:00 | Second Street Bridge |
| 5 | 9/21/2010 | WP105 | 14.4 | left | 17:00 | |
| 5 | 9/21/2010 | WP106 | 14.7 | left | 21:40 | |
| 5 | 9/21/2010 | WP107 | 14.7 | left | 22:45 | |
| 5 | 9/21/2010 | WP108 | 14.8 | left | 24:06 | |
| 5 | 9/21/2010 | WP109 | 14.9 | left | 25:05 | |
| 5 | 9/21/2010 | WP110 | 15.0 | left | 26:35 | Eighth Street Bridge |

Table 1. Video timestamp log for LPRSA surveyed waypoints

| Video Number | Date | Waypoint | Approximate RM | Bank ^a | Waypoint Start Time ^b | Field Notes |
|--------------|-----------|----------|----------------|-------------------|----------------------------------|--|
| 5 | 9/21/2010 | WP111 | 15.7 | left | 39:50 | Passaic Street Bridge |
| 5 | 9/21/2010 | WP112 | 16.0 | left | 46:05 | two bridges at RM 16 (Monroe Street Bridge) |
| 5 | 9/21/2010 | WP113 | 16.1 | left | 47:35 | |
| 5 | 9/21/2010 | WP114 | 16.2 | left | 50:40 | Monroe Street Bridge, railroad trestle |
| 6 | 9/21/2010 | WP115 | 15.5 | right | 4:15 | Saddle River; 8th Street Bridge, small boat ramp, and Second Street Bridge |
| 6 | 9/21/2010 | WP116 | 14.3 | right | 30:00 | |
| 6 | 9/21/2010 | WP117 | 14.1 | right | 33:53 | |
| 6 | 9/21/2010 | WP118 | 13.9 | right | 35:40 | |
| 6 | 9/21/2010 | WP119 | 13.4 | right | 37:00 | Main Street bridge |
| 6 | 9/21/2010 | WP120 | 13.3 | right | 44:55 | CPG field facility |
| 6 | 9/21/2010 | WP121 | 13.3 | right | 45:20 | |
| 6 | 9/21/2010 | WP122 | 13.2 | right | 27:00 | |
| 6 | 9/21/2010 | WP123 | 12.5 | right | 49:20 | Union Street Bridge |
| 6 | 9/21/2010 | WP124 | 12.4 | right | 50:03 | |
| 6 | 9/21/2010 | WP125 | 12.3 | right | 55:38 | |
| 7 | 9/21/2010 | WP126 | 12.1 | right | 0:07 | Nereid Boat Club |
| 7 | 9/21/2010 | WP127 | 12.1 | right | 7:00 | |
| 7 | 9/21/2010 | WP128 | 11.6 | right | 17:30 | Route 3 Bridge |
| 7 | 9/21/2010 | WP129 | 11.0 | right | 20:10 | Conrail Lynhurst Bridge |
| 7 | 9/21/2010 | WP130 | 10.8 | right | 24:20 | Riverside Park, just downstream of boat ramp |
| 7 | 9/21/2010 | WP131 | 10.5 | right | 28:43 | Riverside Park, just downstream of boat ramp |
| 7 | 9/21/2010 | WP132 | 10.3 | right | 36:30 | DeJessa Bridge |
| 7 | 9/21/2010 | WP133 | 10.2 | right | 37:30 | |
| 7 | 9/21/2010 | WP134 | 10.1 | right | 39:00 | |
| 7 | 9/21/2010 | WP135 | 9.8 | right | 43:54 | |
| 7 | 9/21/2010 | WP136 | 9.7 | right | 45:35 | |
| 7 | 9/21/2010 | WP137 | 9.6 | right | 46:40 | power lines |
| 7 | 9/21/2010 | WP138 | 9.5 | right | 47:00 | |
| 7 | 9/21/2010 | WP139 | 9.5 | right | 48:35 | boat ramp |
| 7 | 9/21/2010 | WP140 | 8.9 | right | 56:45 | small mudflat |
| 7 | 9/21/2010 | WP141 | 8.8 | right | 57:35 | bordering park |

Table 1. Video timestamp log for LPRSA surveyed waypoints

| Video Number | Date | Waypoint | Approximate RM | Bank ^a | Waypoint Start Time ^b | Field Notes |
|--------------|-----------|----------|----------------|-------------------|----------------------------------|--|
| 7 | 9/21/2010 | WP142 | 8.6 | right | 60:04 | |
| 8 | 9/21/2010 | WP143 | 8.4 | right | 1:20 | Route 7 Bridge to Kearny/Nutley High School boat club/ramp |
| 8 | 9/21/2010 | WP144 | 16.6 | right | 2:05 | |
| 8 | 9/21/2010 | WP145 | 17.0 | right | 4:20 | Fort Ford |
| 8 | 9/21/2010 | WP146 | 17.2 | right | 6:30 | |

^a Left bank is the bank on the left of the river when facing upstream; right bank is the bank on the right of the river when facing upstream.

^b Waypoint start time refers to the video timestamp (in minutes and seconds).

CPG – Cooperating Parties Group

RM – River Mile

LPRSA – Lower Passaic River Study Area

Table 2. Video timestamp log for LPRSA tributary surveyed waypoints

| Video Number | Date | Waypoint | Tributary | Waypoint Start Time ^a | Location Name ^b |
|--------------|-----------|----------|--------------|----------------------------------|----------------------------|
| 8 | 9/22/2010 | WP147 | Second River | 8:45 | Passaic |
| 8 | 9/22/2010 | WP148 | Second River | 9:40 | Belleville |
| 8 | 9/22/2010 | WP149 | Second River | 11:00 | Bloomfield |
| 8 | 9/22/2010 | WP150 | Second River | 12:10 | Watsessing Park |
| 8 | 9/22/2010 | WP151 | Second River | 13:35 | Mills |
| 8 | 9/22/2010 | WP152 | Second River | 15:00 | Wigwam Brook |
| 8 | 9/22/2010 | WP153 | Third River | 16:00 | Glen Ridge Country Club |
| 8 | 9/22/2010 | WP154 | Third River | 17:00 | JFK Parkway |
| 8 | 9/22/2010 | WP155 | Third River | 18:35 | Forest Hills Field Club |
| 8 | 9/22/2010 | WP156 | Third River | 21:00 | Clarks Pond |
| 8 | 9/22/2010 | WP157 | Third River | 21:05 | Bonsal Wildlife Park |
| 8 | 9/22/2010 | WP158 | Third River | 23:10 | Clifton Pond |
| 8 | 9/22/2010 | WP159 | Saddle River | 23:15 | Ox Bow |
| 8 | 9/22/2010 | WP160 | Saddle River | 25:20 | Felician College South |
| 8 | 9/22/2010 | WP161 | Saddle River | 25:25 | Lodi Cemeteries |
| 8 | 9/22/2010 | WP162 | Saddle River | 26:55 | County Park |
| 8 | 9/22/2010 | WP163 | Saddle River | 27:45 | Arcola Pool Site |
| 8 | 9/23/2010 | WP164 | Third River | 29:20 | River Mouth |

^a Waypoint start time refers to the video timestamp (in minutes and seconds).

^b Specific locations requested by USACE and considered to be potential LPRSA tributary restoration site locations.

LPRSA – Lower Passaic River Study Area

WP – waypoint

USACE – US Army Corps of Engineers

APPENDIX D: LPRSA LAND USE AND SHORELINE FEATURES FOR HUMAN ACCESS AND EXPOSURE FIGURE

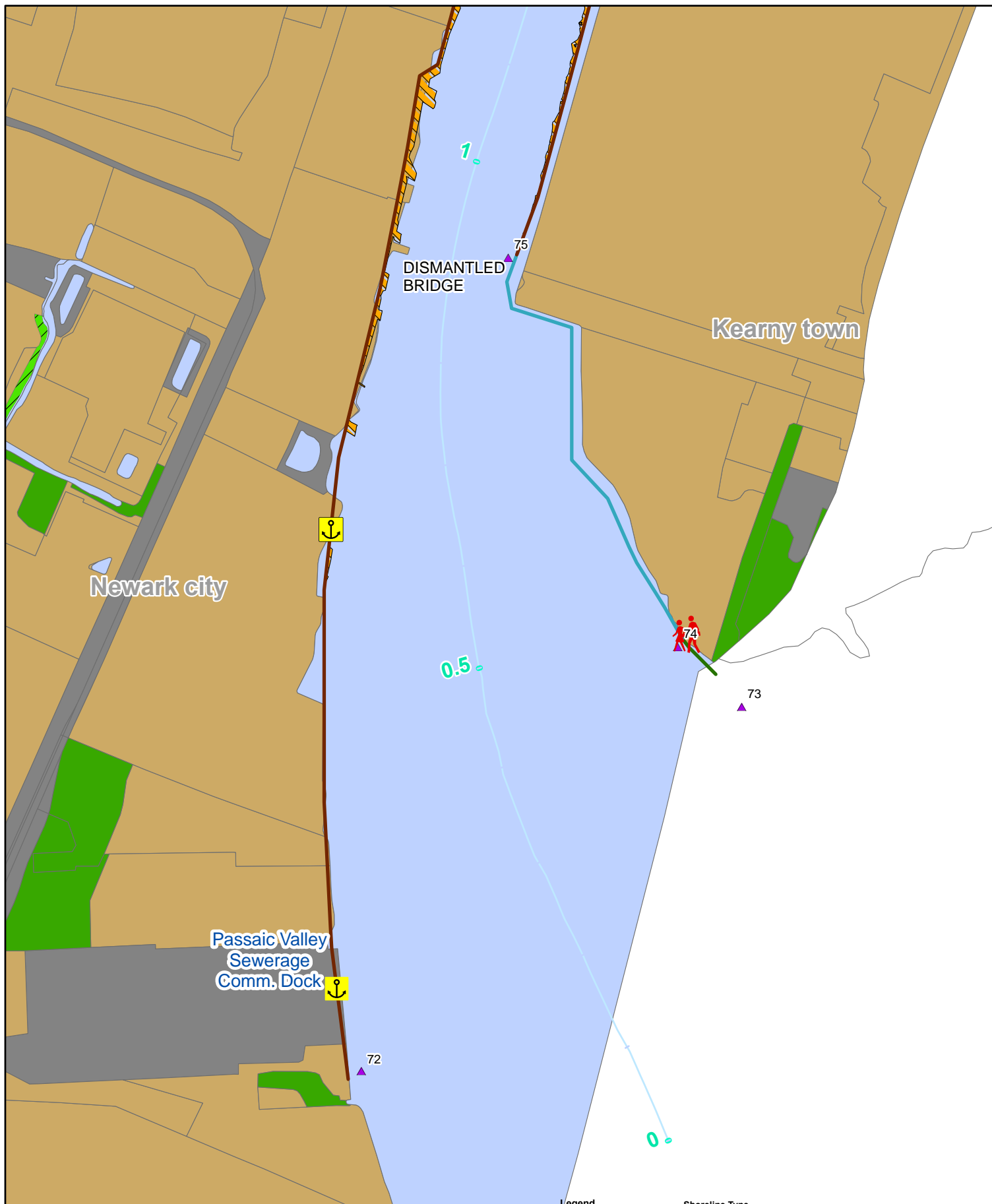


Figure D-1 LPRSA Land Use and Shoreline Features for Human Access and Exposure

NOTES: Shoreline type was estimated based on 2010 habitat survey field observations and photo documentation.

Potentially accessible sediment between RM 15 and Dundee Dam estimated from CPG aerial photography (2007) and groundtruthed during 2010 habitat survey.

Legend

- ▲ Waypoint
- Passaic River Centerline (miles)
- Access to Shore
- Boat Dock/Launch
- Fishing Observed

Shoreline Type

- Natural/Vegetated
- RipRap/Stone
- Sheet Pile/Bulkhead
- Potentially Accessible Sediment (> -2 MLW below RM 15)
- Land Use 2007
- INDUSTRIAL/COMMERCIAL/URBAN
- RESIDENTIAL
- RECREATIONAL/OPEN SPACE
- INFRASTRUCTURE
- WETLANDS
- WATER



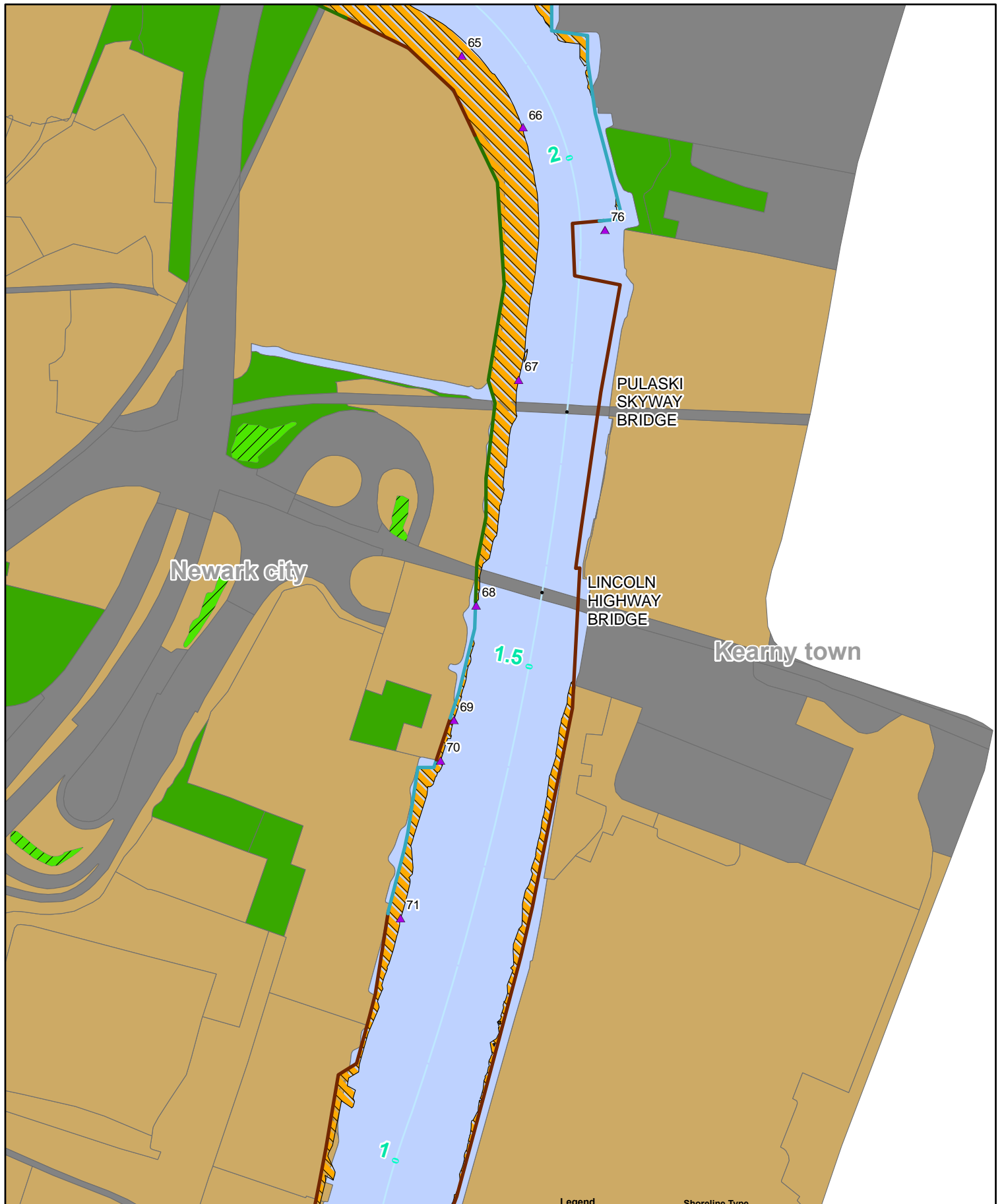
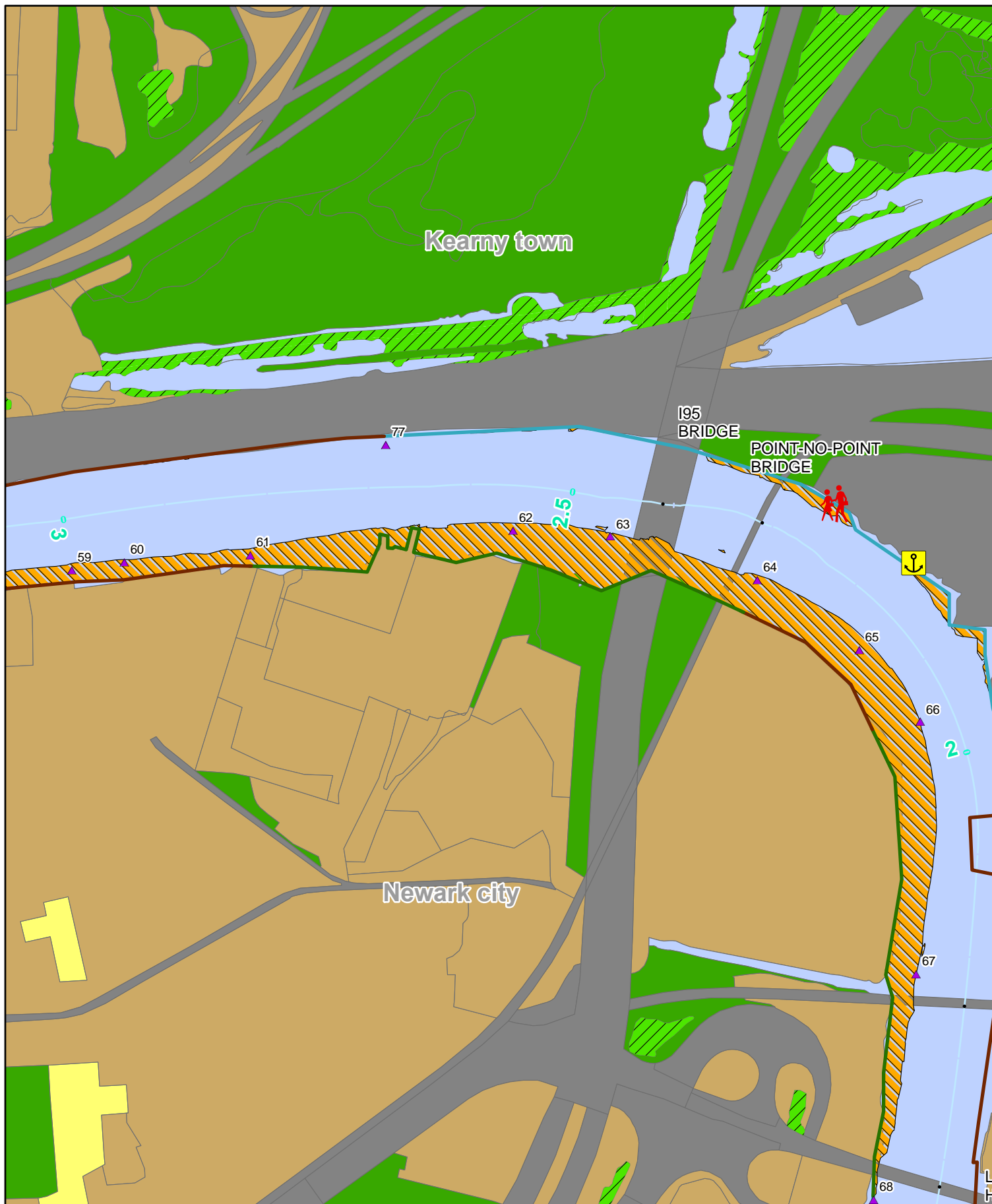


Figure D-1 LPRSA Land Use and Shoreline Features for Human Access and Exposure

NOTES: Shoreline type was estimated based on 2010 habitat survey field observations and photo documentation.

Potentially accessible sediment between RM 15 and Dundee Dam estimated from CPG aerial photography (2007) and groundtruthed during 2010 habitat survey.





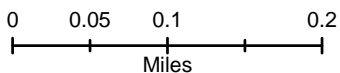
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Figure D-1 LPRSA Land Use and Shoreline Features for Human Access and Exposure

NOTES: Shoreline type was estimated based on 2010 habitat survey field observations and photo documentation.

Potentially accessible sediment between RM 15 and Dundee Dam estimated from CPG aerial photography (2007) and groundtruthed during 2010 habitat survey.

Sheet 3 of 17



Legend

- Waypoint
- Passaic River Centerline (miles)
- Access to Shore
- Boat Dock/Launch
- Fishing Observed

Shoreline Type

- Natural/Vegetated
- RipRap/Stone
- Sheet Pile/Bulkhead
- Potentially Accessible Sediment (> -2 MLW below RM 15)

Land Use 2007

- INDUSTRIAL/COMMERCIAL/URBAN
- RESIDENTIAL
- RECREATIONAL/OPEN SPACE
- INFRASTRUCTURE
- WETLANDS
- WATER



AECOM

February 2011
Land Use: NJDEP, 2007
Coordinate System: NJ State Plane, Feet

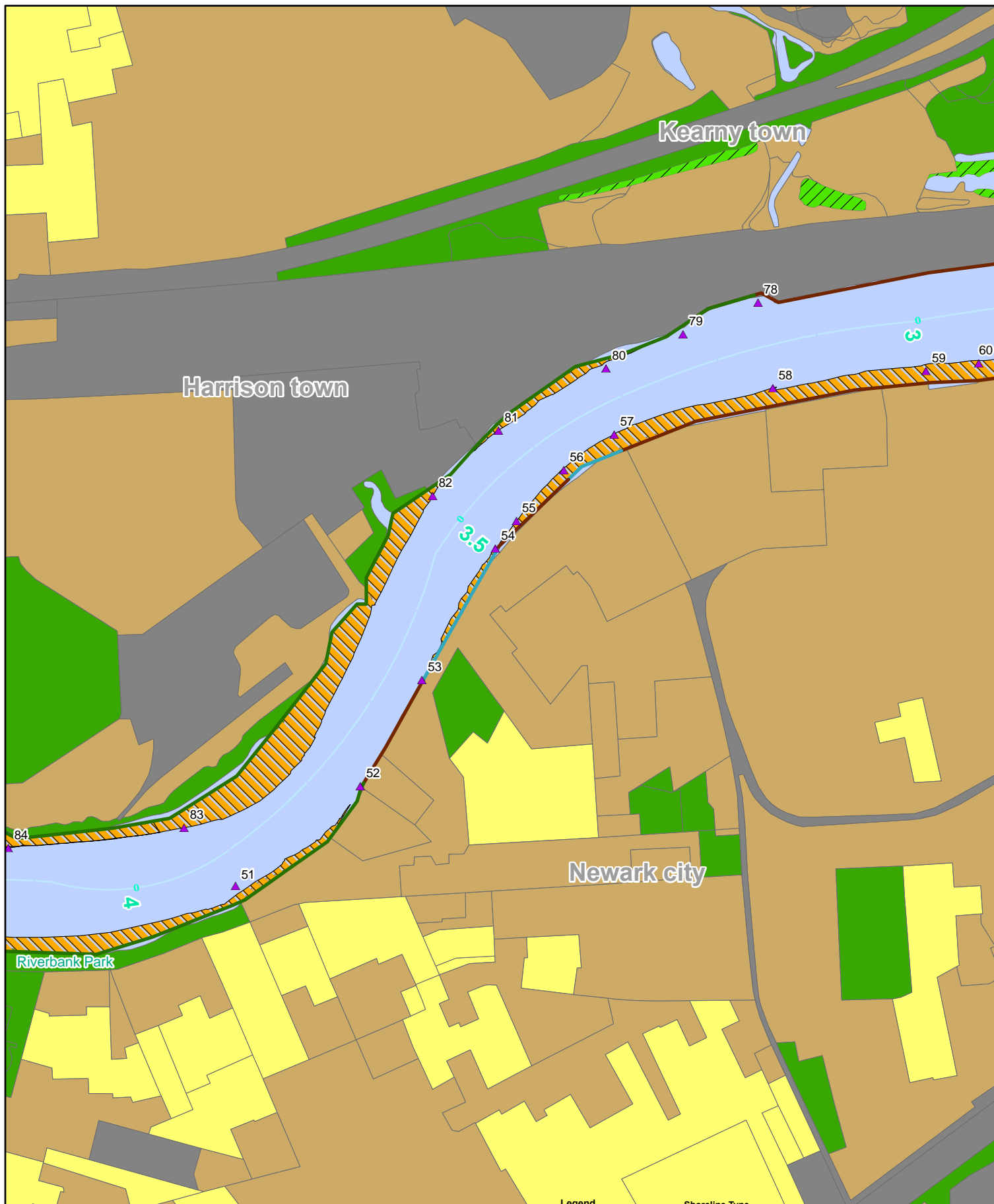


Figure D-1 LPRSA Land Use and Shoreline Features for Human Access and Exposure

NOTES: Shoreline type was estimated based on 2010 habitat survey field observations and photo documentation.

Potentially accessible sediment between RM 15 and Dundee Dam estimated from CPG aerial photography (2007) and groundtruthed during 2010 habitat survey.

- Legend**
- Waypoint
 - Passaic River Centerline (miles)
 - Access to Shore
 - Boat Dock/Launch
 - Fishing Observed

- Shoreline Type**
- Natural/Vegetated
 - RipRap/Stone
 - Sheet Pile/Bulkhead
 - Potentially Accessible Sediment (> -2 MLW below RM 15)
- Land Use 2007**
- INDUSTRIAL/COMMERCIAL/URBAN
 - RESIDENTIAL
 - RECREATIONAL/OPEN SPACE
 - INFRASTRUCTURE
 - WETLANDS
 - WATER



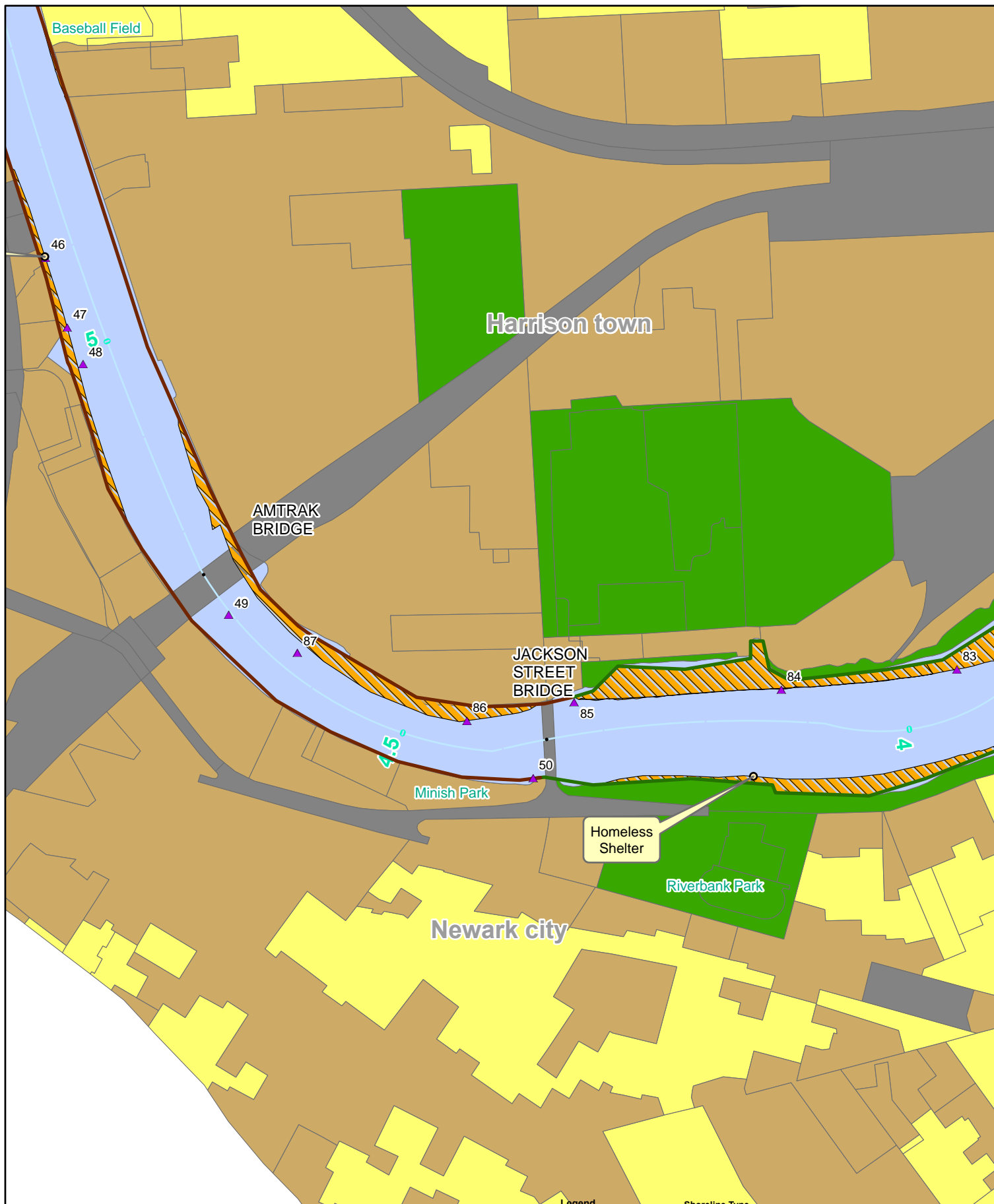


Figure D-1
LPRSA Land Use and Shoreline Features for Human Access and Exposure

NOTES: Shoreline type was estimated based on 2010 habitat survey field observations and photo documentation.

Potentially accessible sediment between RM 15 and Dundee Dam estimated from CPG aerial photography (2007) and groundtruthed during 2010 habitat survey.

- Legend**
- Waypoint
 - Passaic River Centerline (miles)
 - Access to Shore
 - Boat Dock/Launch
 - Fishing Observed

- Shoreline Type**
- Natural/Vegetated
 - RipRap/Stone
 - Sheet Pile/Bulkhead
 - Potentially Accessible Sediment (> -2 MLW below RM 15)
- Land Use 2007**
- INDUSTRIAL/COMMERCIAL/URBAN
 - RESIDENTIAL
 - RECREATIONAL/OPEN SPACE
 - INFRASTRUCTURE
 - WETLANDS
 - WATER



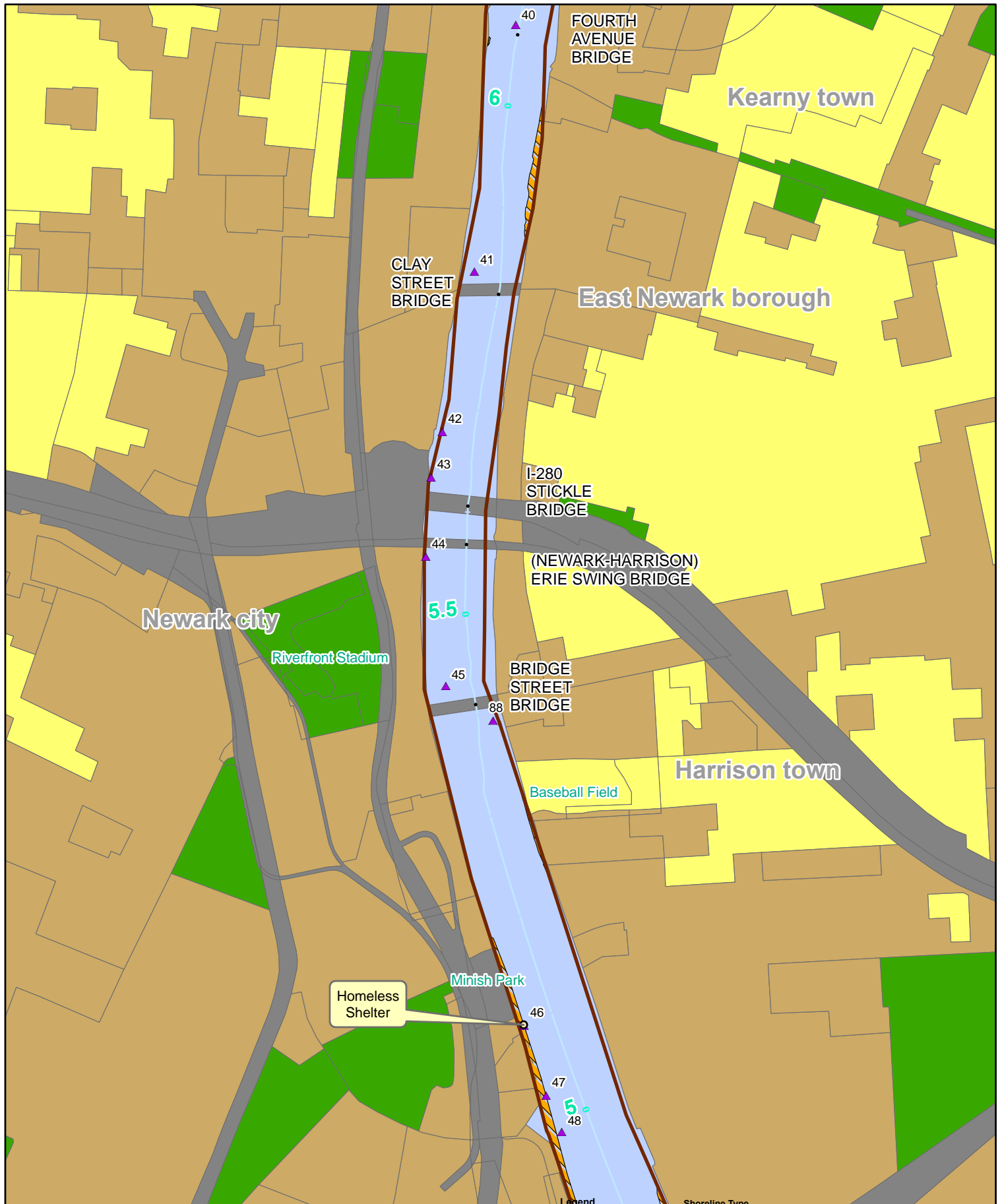


Figure D-1 LPRSA Land Use and Shoreline Features for Human Access and Exposure

NOTES: Shoreline type was estimated based on 2010 habitat survey field observations and photo documentation.

Potentially accessible sediment between RM 15 and Dundee Dam estimated from CPG aerial photography (2007) and groundtruthed during 2010 habitat survey.

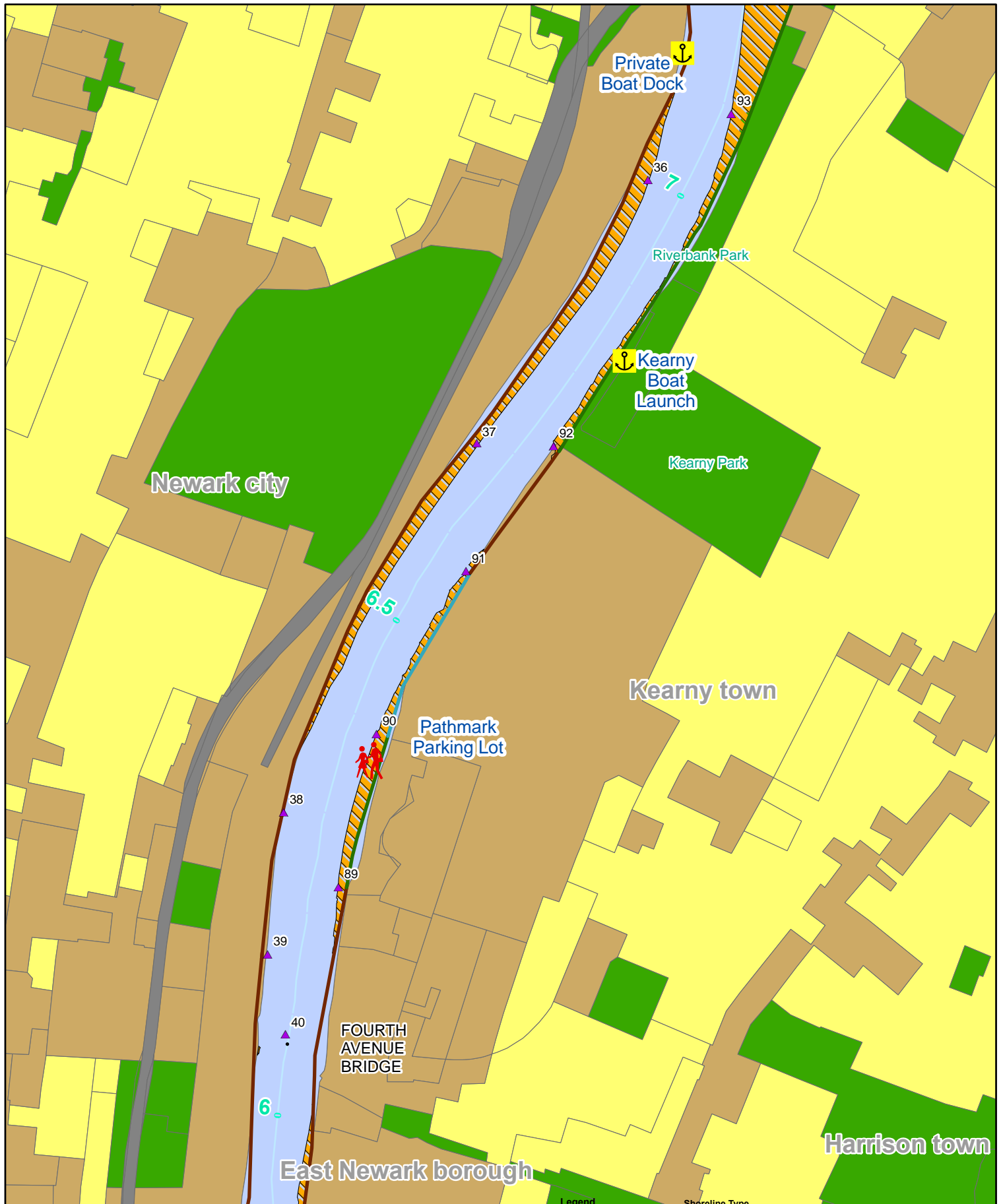
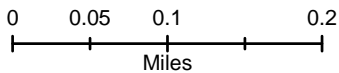


Figure D-1 LPRSA Land Use and Shoreline Features for Human Access and Exposure

NOTES: Shoreline type was estimated based on 2010 habitat survey field observations and photo documentation.

Potentially accessible sediment between RM 15 and Dundee Dam estimated from CPG aerial photography (2007) and groundtruthed during 2010 habitat survey.



- Legend**
- Waypoint
 - Passaic River Centerline (miles)
 - Access to Shore
 - Boat Dock/Launch
 - Fishing Observed

- Shoreline Type**
- Natural/Vegetated
 - RipRap/Stone
 - Sheet Pile/Bulkhead
 - Potentially Accessible Sediment (> -2 MLW below RM 15)
 - Old Use 2007
 - INDUSTRIAL/COMMERCIAL/URBAN
 - RESIDENTIAL
 - RECREATIONAL/OPEN SPACE
 - INFRASTRUCTURE
 - WETLANDS
 - WATER



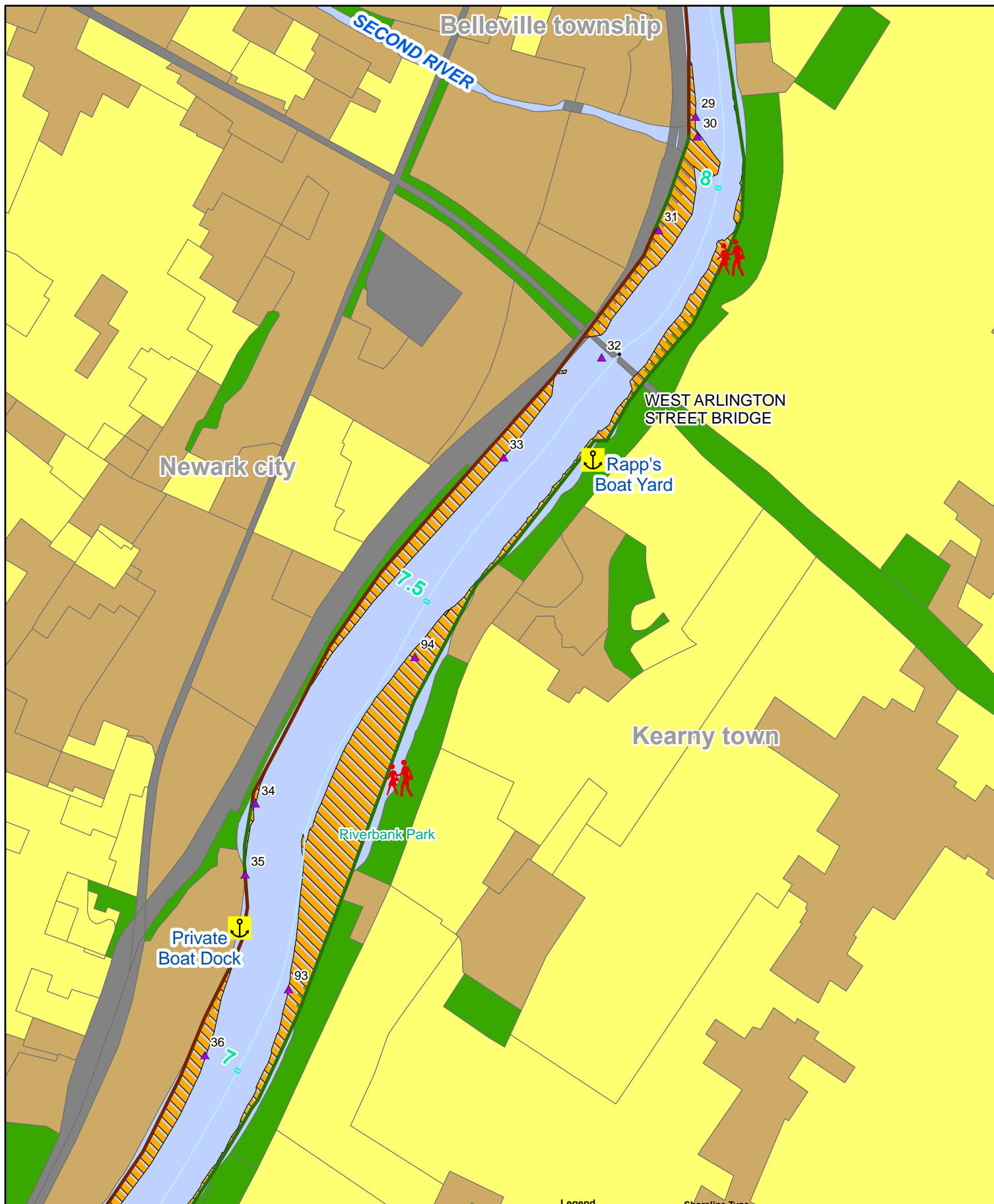
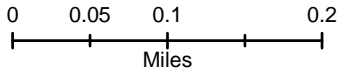


Figure D-1 LPRSA Land Use and Shoreline Features for Human Access and Exposure

NOTES: Shoreline type was estimated based on 2010 habitat survey field observations and photo documentation.

Potentially accessible sediment between RM 15 and Dundee Dam estimated from CPG aerial photography (2007) and groundtruthed during 2010 habitat survey.



- Legend**
- Waypoint
 - Passaic River Centerline (miles)
 - Access to Shore
 - Boat Dock/Launch
 - Fishing Observed

- Shoreline Type**
- Natural/Vegetated
 - RipRap/Stone
 - Sheet Pile/Bulkhead
 - Potentially Accessible Sediment (> -2 MLW below RM 15)
- Land Use 2007**
- INDUSTRIAL/COMMERCIAL/URBAN
 - RESIDENTIAL
 - RECREATIONAL/OPEN SPACE
 - INFRASTRUCTURE
 - WETLANDS
 - WATER



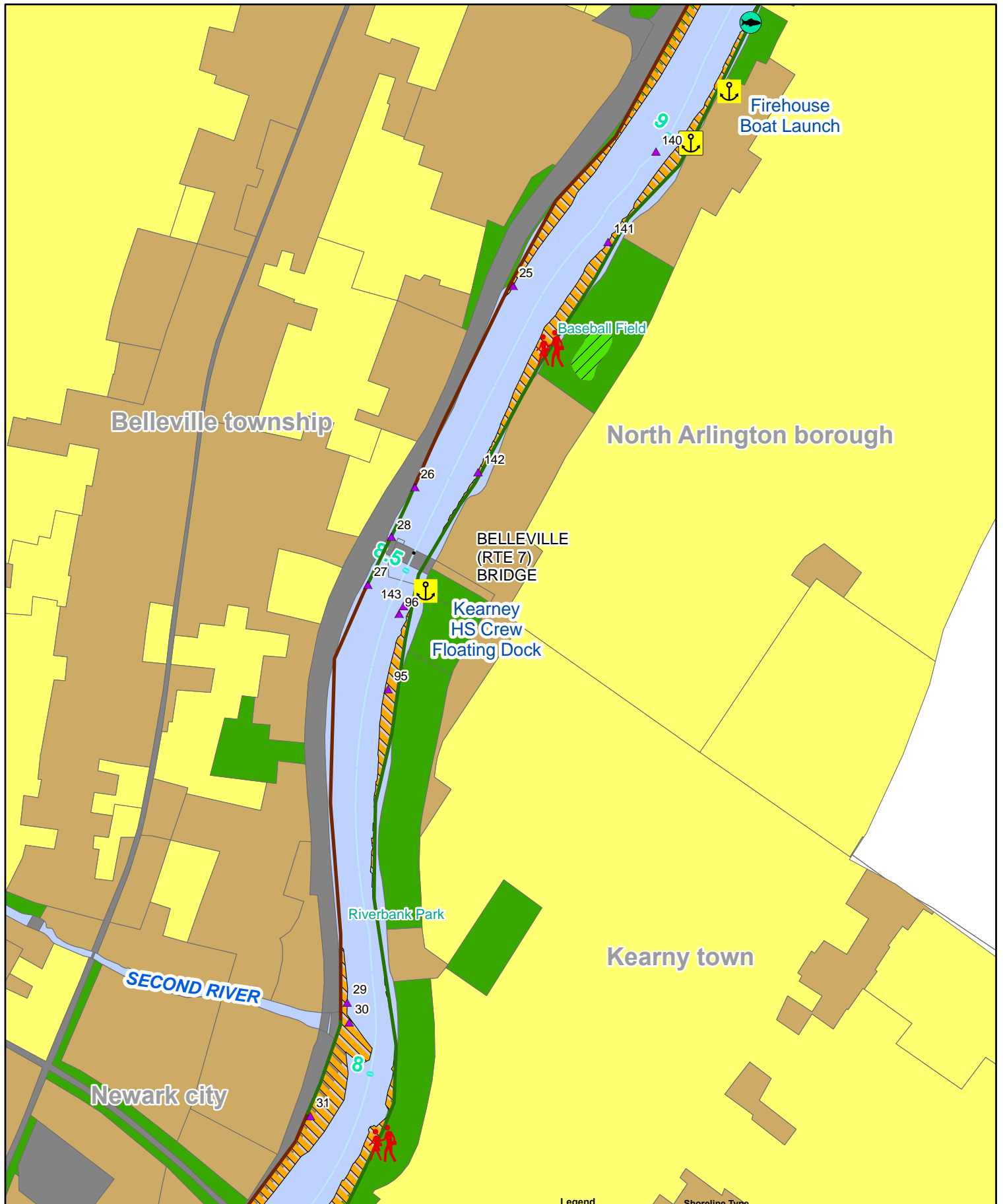


Figure D-1 LPRSA Land Use and Shoreline Features for Human Access and Exposure

NOTES: Shoreline type was estimated based on 2010 habitat survey field observations and photo documentation.

Potentially accessible sediment between RM 15 and Dundee Dam estimated from CPG aerial photography (2007) and groundtruthed during 2010 habitat survey.



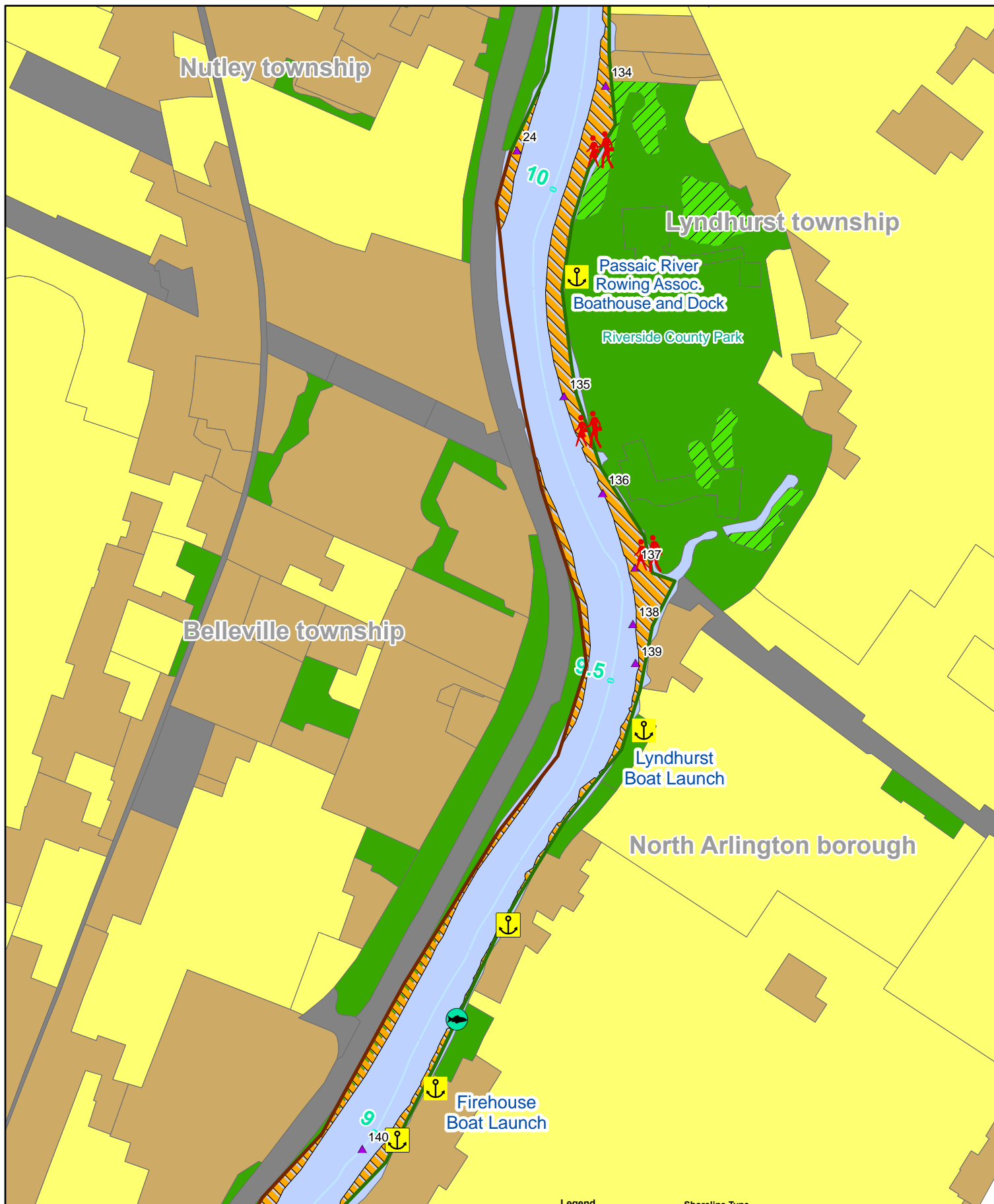
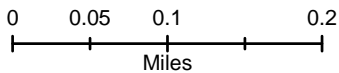


Figure D-1 LPRSA Land Use and Shoreline Features for Human Access and Exposure

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- Legend**
- Waypoint
 - Passaic River Centerline (miles)
 - Access to Shore
 - Boat Dock/Launch
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- Shoreline Type**
- Natural/Vegetated
 - RipRap/Stone
 - Sheet Pile/Bulkhead
 - Potentially Accessible Sediment (> -2 MLW below RM 15)
 - Land Use 2007
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 - RESIDENTIAL
 - RECREATIONAL/OPEN SPACE
 - INFRASTRUCTURE
 - WETLANDS
 - WATER



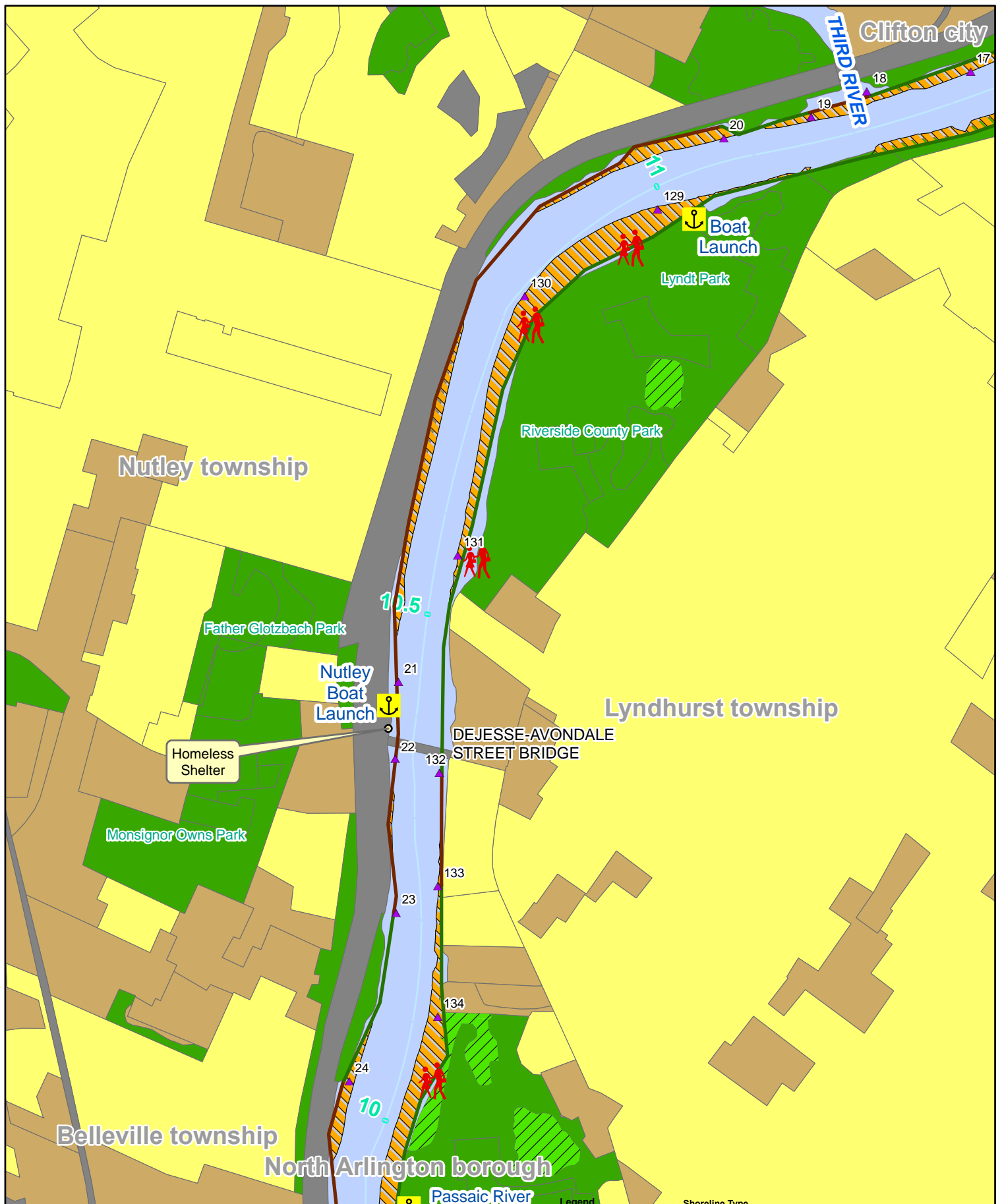
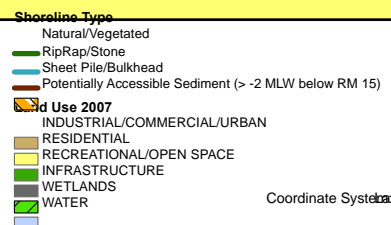
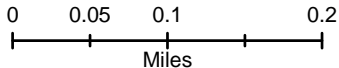


Figure D-1 LPRSA Land Use and Shoreline Features for Human Access and Exposure

NOTES: Shoreline type was estimated based on 2010 habitat survey field observations and photo documentation.

Potentially accessible sediment between RM 15 and Dundee Dam estimated from CPG aerial photography (2007) and groundtruthed during 2010 habitat survey.



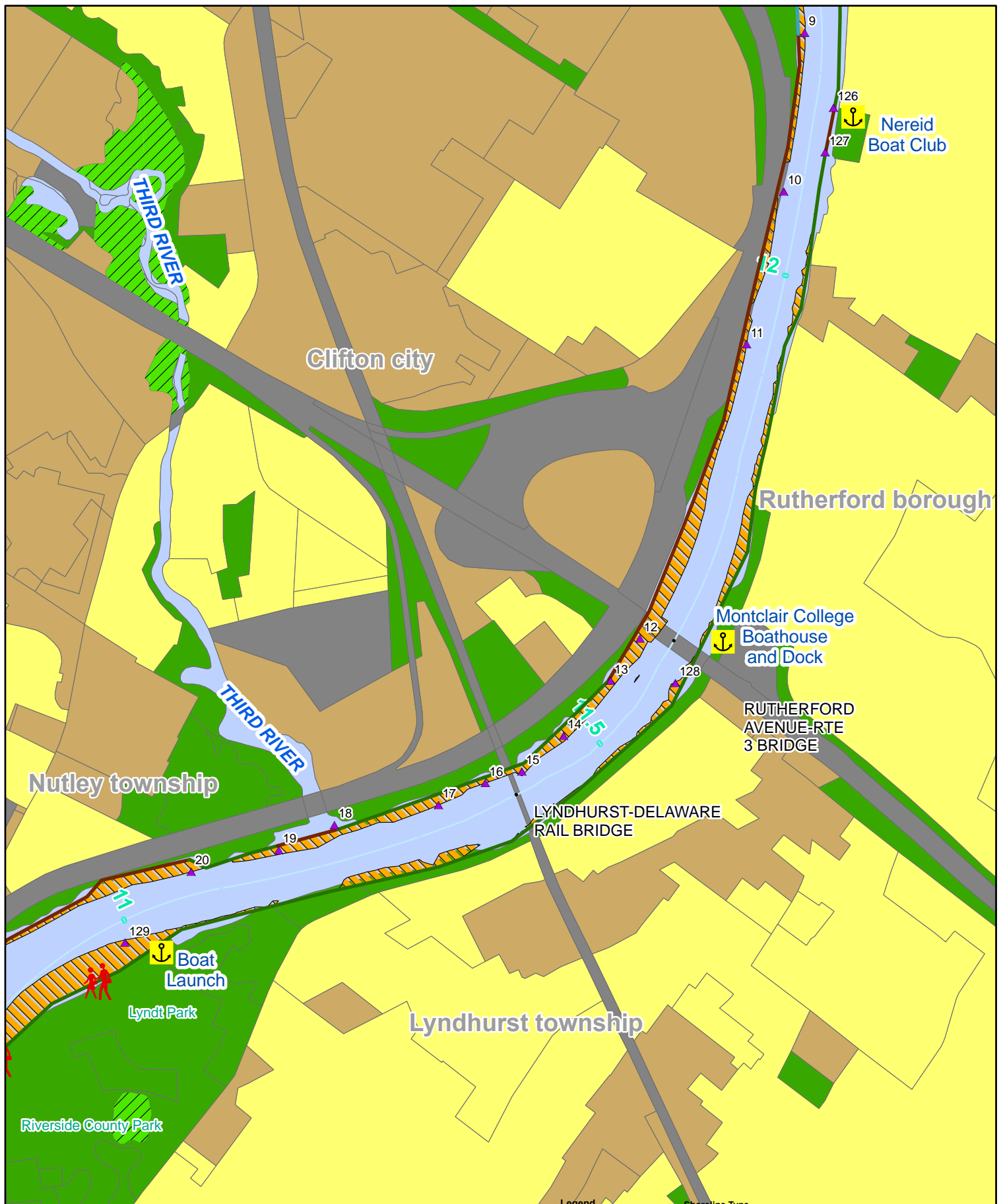


Figure D-1
LPRSA Land Use and Shoreline Features for Human Access and Exposure

NOTES: Shoreline type was estimated based on 2010 habitat survey field observations and photo documentation.

Potentially accessible sediment between RM 15 and Dundee Dam estimated from CPG aerial photography (2007) and groundtruthed during 2010 habitat survey.



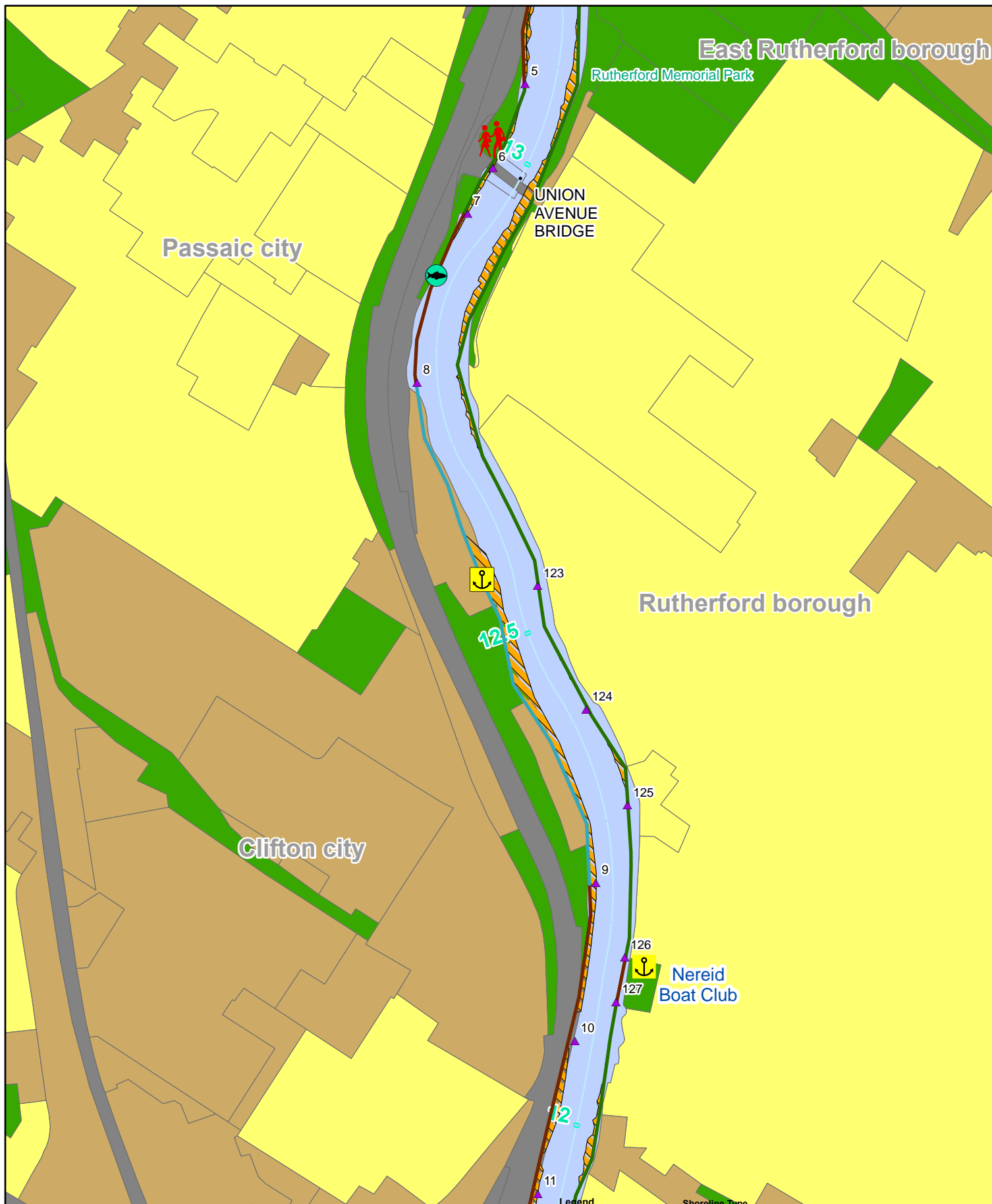
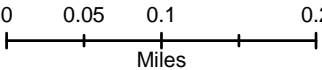


Figure D-1 LPRSA Land Use and Shoreline Features for Human Access and Exposure

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Potentially accessible sediment between RM 15 and Dundee Dam estimated from CPG aerial photography (2007) and groundtruthed during 2010 habitat survey.



- Legend**

 - Waypoint
 - Passaic River Centerline (miles)
 - Access to Shore
 - Boat Dock/Launch
 - Fishing Observed
- Shoreline Type**

 - Natural/Vegetated
 - RipRap/Stone
 - Sheet Pile/Bulkhead
 - Potentially Accessible Sediment (> -2 MLW below RM 15)

Old Use 2007

 - INDUSTRIAL/COMMERCIAL/URBAN
 - RESIDENTIAL
 - RECREATIONAL/OPEN SPACE
 - INFRASTRUCTURE
 - WETLANDS
 - WATER

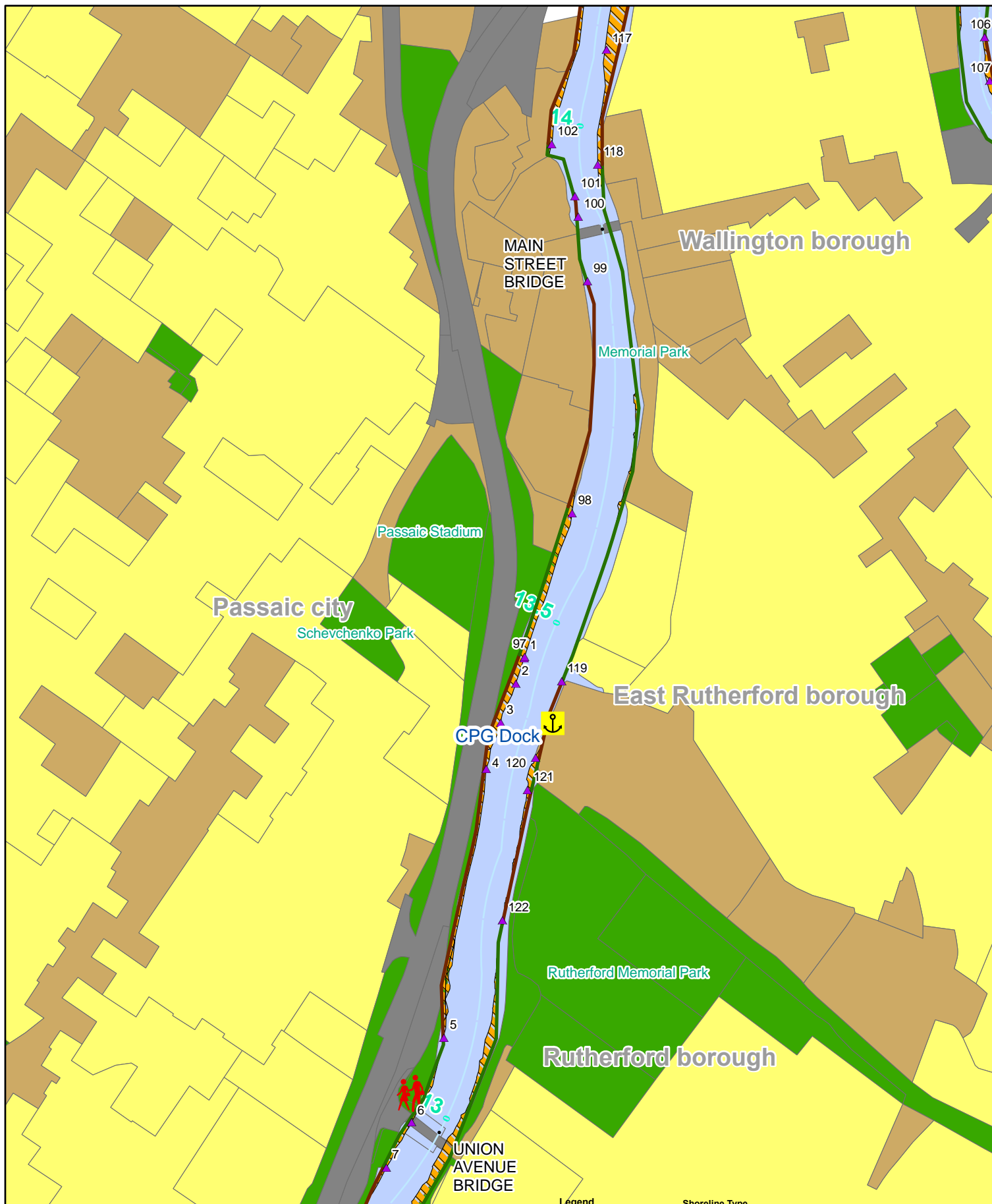
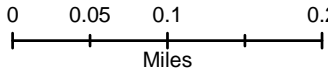


Figure D-1 LPRSA Land Use and Shoreline Features for Human Access and Exposure

NOTES: Shoreline type was estimated based on 2010 habitat survey field observations and photo documentation.

Potentially accessible sediment between RM 15 and Dundee Dam estimated from CPG aerial photography (2007) and groundtruthed during 2010 habitat survey.



- Legend**
- Waypoint
 - Passaic River Centerline (miles)
 - Access to Shore
 - Boat Dock/Launch
 - Fishing Observed

- Shoreline Type**
- Natural/Vegetated
 - RipRap/Stone
 - Sheet Pile/Bulkhead
 - Potentially Accessible Sediment (> -2 MLW below RM 15)
- Land Use 2007**
- INDUSTRIAL/COMMERCIAL/URBAN
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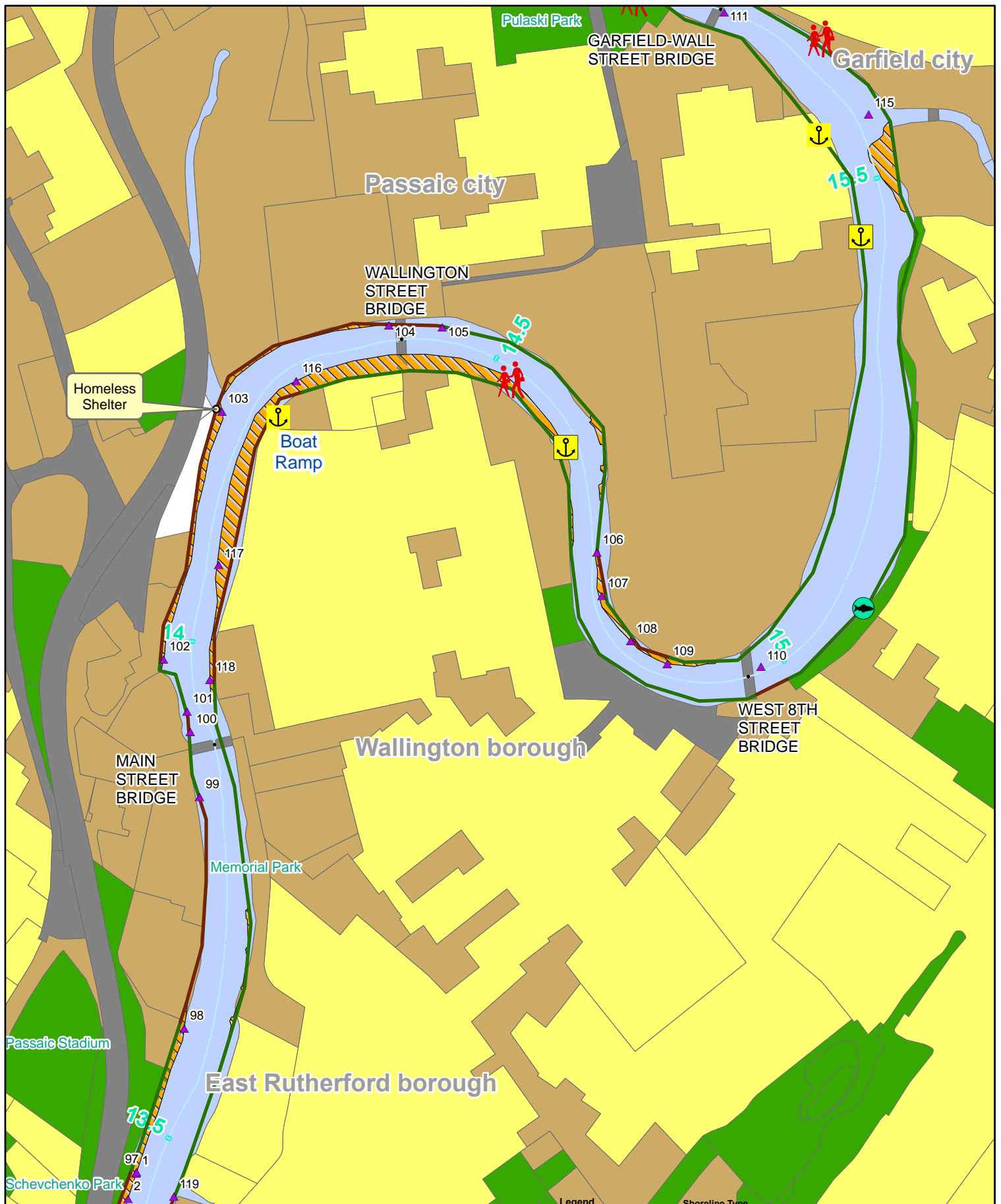


Figure D-1 LPRSA Land Use and Shoreline Features for Human Access and Exposure

NOTES: Shoreline type was estimated based on 2010 habitat survey field observations and photo documentation.

Potentially accessible sediment between RM 15 and Dundee Dam estimated from CPG aerial photography (2007) and groundtruthed during 2010 habitat survey.

- Legend**
- Waypoint
 - Passaic River Centerline (miles)
 - Access to Shore
 - Boat Dock/Launch
 - Fishing Observed

- Shoreline Type**
- Natural/Vegetated
 - RipRap/Stone
 - Sheet Pile/Bulkhead
 - Potentially Accessible Sediment (> -2 MLW below RM 15)
- Land Use 2007**
- INDUSTRIAL/COMMERCIAL/URBAN
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 - RECREATIONAL/OPEN SPACE
 - INFRASTRUCTURE
 - WETLANDS
 - WATER



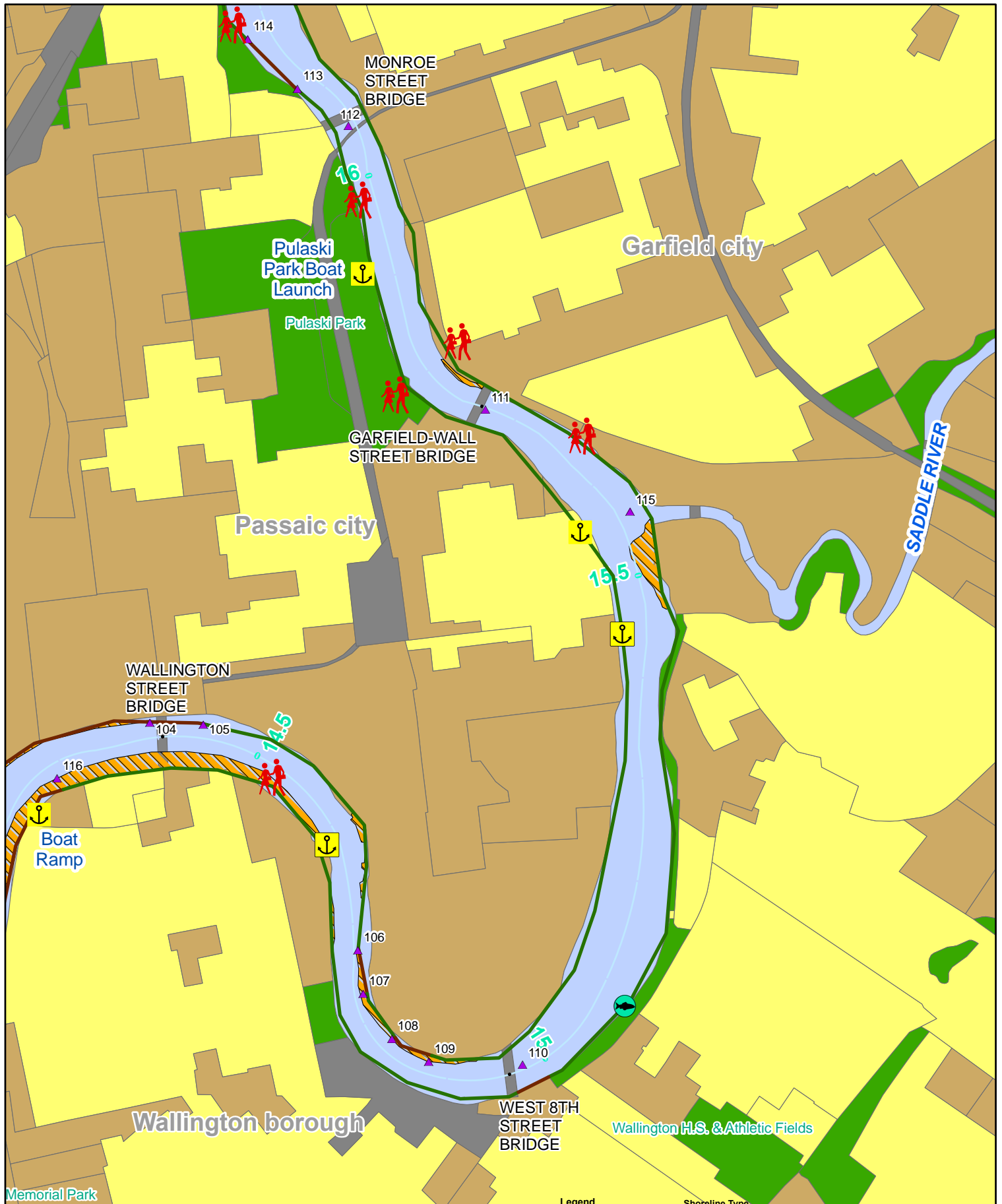


Figure D-1
LPRSA Land Use and Shoreline Features for Human Access and Exposure

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Potentially accessible sediment between RM 15 and Dundee Dam estimated from CPG aerial photography (2007) and groundtruthed during 2010 habitat survey.



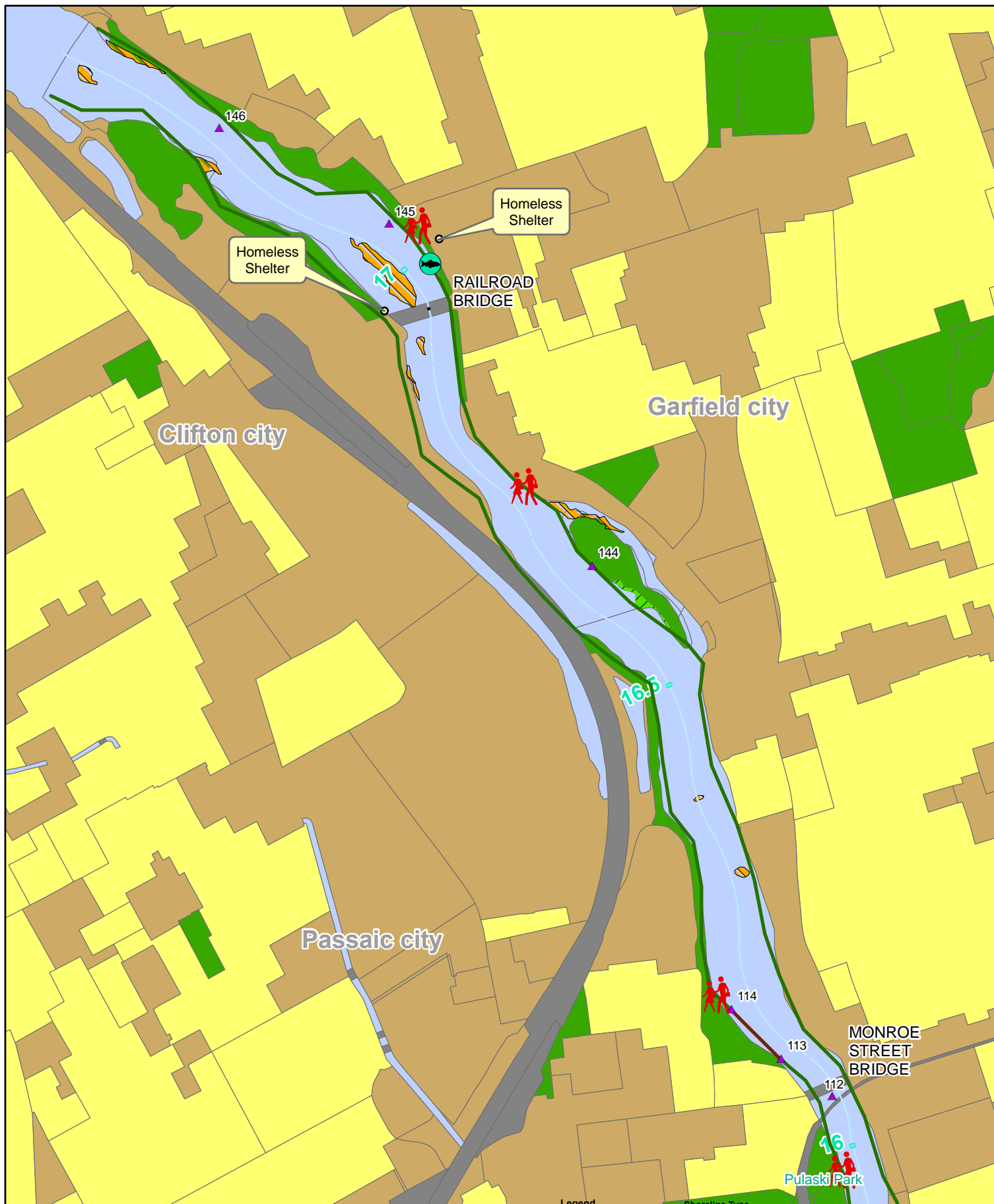
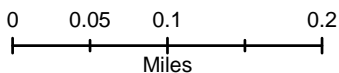


Figure D-1
LPRSA Land Use and Shoreline Features for Human Access and Exposure

NOTES: Shoreline type was estimated based on 2010 habitat survey field observations and photo documentation.

Potentially accessible sediment between RM 15 and Dundee Dam estimated from CPG aerial photography (2007) and groundtruthed during 2010 habitat survey.



APPENDIX E: PHOTO LOG



In support of AECOM's efforts to document observations related to identifying potential human uses of and exposures to the LPRSA, photographs were taken to document pertinent features. As presented in the LPRSA Human Access/Exposure Identification Survey Form, which is in Attachment T of the Benthic QAPP Addendum No. 3 (Windward 2010),¹ these may include:

- ◆ The presence of fencing, buildings, infrastructure, or other features that may affect access
- ◆ Characteristics of shoreline and intertidal areas
- ◆ Shoreline features, such as parks/green space, docks, boat ramps, benches, or other amenities
- ◆ Evidence of human use or activities (e.g., boating, fishing), established paths, trails to or along the shoreline, abutting residential properties with steps/access to shoreline

As such, this photographic log serves to illustrate features relevant to human use of the LPRSA but does not necessarily reflect the habitat of the Study Area.

¹ Windward. 2010. Lower Passaic River Restoration Project. Lower Passaic River Study Area RI/FS. Habitat identification survey: Addendum to the Quality Assurance Project Plan. Surface sediment chemical analyses and benthic invertebrate toxicity and bioaccumulation testing. Addendum No. 3. Final. Prepared for Cooperating Parties Group, Newark, New Jersey. September 13, 2010. Windward Environmental LLC, Seattle, WA.

| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|---|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 1 | Date: 09/20/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 0.2 Passaic Valley Sewer Sewerage Commission dock | | | |
| Photo No. 2 | Date: 09/20/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 0.5 Port area | | | |

| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 3 | Date: 09/20/10 |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 0.6 Boat dock adjacent to bulkhead pier | | | |
| Photo No. 4 | Date: 09/20/10 |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 1.5 Industrial properties | | | |

| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|---|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 5 | Date: 09/20/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 2.4 I-95 Bridge | | | |
| Photo No. 6 | Date: 09/20/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 2.6 | | | |

| PHOTOGRAPHIC LOG | | |
|---|--|--|
| Site Name: Lower Passaic River Restoration Project | | |
| Site Location: Lower Passaic River Study Area, NJ | | |
| Project No. 60145884 | | |

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| Photo No. 7 | | |
| Date: 09/20/10 | | |
| Direction Photo Taken: | | |
| Description: Left (West) Bank | | |
| RM 2.8 | | |





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| Photo No. 8 | | |
| Date: 09/20/10 | | |
| Direction Photo Taken: | | |
| Left (West) Bank | | |
| Description: | | |
| RM 2.9 | | |
| Shipping containers along | | |
| bulkhead | | |





| PHOTOGRAPHIC LOG | | | |
|---|--------------------------|---|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 9 | Date: 09/20/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 3.0 Bulkhead along 80 Lister Avenue site | | | |
| Photo No. 10 | Date: 09/20/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 3.5 | | | |

| PHOTOGRAPHIC LOG | | | |
|---|--------------------------|---|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 11 | Date: 09/20/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 4.2 Homeless camp | | | |
| Photo No. 12 | Date: 09/20/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 5.0 Open space with Newark in background | | | |



| PHOTOGRAPHIC LOG | | | |
|---|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 13 | Date: 09/20/10 |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 5.0 Open space with Newark in background | | | |
| Photo No. 14 | Date: 09/20/10 |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 5.1 Open space with Newark in background | | | |

| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|---|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 15 | Date: 09/20/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 5.4 | | | |
| Photo No. 16 | Date: 09/20/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 5.6 I-280 Bridge | | | |



| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 17 | Date: 09/20/10 |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 5.5 | | | |
| Photo No. 18 | Date: 09/20/10 |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 6.5 | | | |

| PHOTOGRAPHIC LOG | | | |
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| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 19 | Date: 09/20/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 6.5 | | | |
| Photo No. 20 | Date: 09/20/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 7.1 Private Boat Dock and Marina | | | |



| PHOTOGRAPHIC LOG | | | |
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| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 21 | Date: 09/20/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 7.5 Route 21 | | | |
| Photo No. 22 | Date: 09/20/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 8.6 Route 7 Bridge | | | |



| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 23 | Date: 09/20/10 |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 8.7 | | | |
| Photo No. 24 | Date: 09/20/10 |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 8.8 | | | |

| PHOTOGRAPHIC LOG | | | |
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| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 25 | Date: 09/20/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 9.7 | | | |
| Photo No. 26 | Date: 09/20/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 10.4 Homeless camp | | | |



| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 27 | Date: 09/20/10 |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 10.5 Nutley Boat Ramp | | | |
| Photo No. 28 | Date: 09/20/10 |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 11.6 | | | |

| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|---|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 29 | Date: 09/20/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 11.7 | | | |
| Photo No. 30 | Date: 09/20/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 12.5 Private boat ramp | | | |



| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 31 | Date: 09/20/10 |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 12.7 | | | |
| Photo No. 32 | Date: 09/20/10 |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 12.8 Fishing observed | | | |



| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 33 | Date: 09/20/10 |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 14.0 | | | |
| | | | |
| Photo No. 34 | Date: 09/20/10 |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 14.0 | | | |
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| PHOTOGRAPHIC LOG | | | |
|---|--------------------------|---|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 35 | Date: 09/21/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 14.2 Homeless camp under the Dundee Canal Bridge | | | |
| Photo No. 36 | Date: | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 14.3 | | | |



| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 37 | Date: 09/21/10 |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 14.5 | | | |
| Photo No. 38 | Date: |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 14.8 | | | |



| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|---|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 39 | Date: 09/21/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 14.9 | | | |
| Photo No. 40 | Date: 09/21/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 15.4 Boat Ramp | | | |



| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 41 | Date: 09/21/10 |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 15.5 Private boat ramp | | | |
| Photo No. 42 | Date: |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 15.9 Pulaski Park Boat Ramp | | | |

| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 43 | Date: 09/21/10 |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 16.0 Pulaski Park | | | |
| Photo No. 44 | Date: 09/21/10 |  | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 16.1 | | | |



| PHOTOGRAPHIC LOG | | | |
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| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 45 | Date: 09/21/10 | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 16.1 Parkland | | | |
| Photo No. 46 | Date: | | |
| Direction Photo Taken: Left (West) Bank | | | |
| Description: RM 16.2 Parkland | | | |

| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 47 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 17.1 (On land) Fishing observed | | | |
| Photo No. 48 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 17.1 (On land) Debris from homeless camp | | | |

| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 49 | Date: 09/20/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 0.4 Kearny Point | | | |
| Photo No. 50 | Date: 09/20/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 1.5 | | | |

| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 51 | Date: 09/20/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 1.9 | | | |
| Photo No. 52 | Date: 09/20/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 2.2 | | | |



PHOTOGRAPHIC LOG



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| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. <div style="font-size: 1.2em; font-weight: bold;">53</div> | Date: 09/20/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 2.3 | | | |
| Photo No. <div style="font-size: 1.2em; font-weight: bold;">54</div> | Date: 09/20/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 4.0 | | | |

| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|---|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 55 | Date: 09/20/10 | | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 4.1 | | | |
| Photo No. 56 | Date: 09/20/10 | | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 5.0 | | | |



| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 57 | Date: 09/20/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 5.5 | | | |
| Photo No. 58 | Date: 09/20/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 5.5 Hampton Inn | | | |

| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|---|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 59 | Date: 09/20/10 | | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 5.6 | | | |
| Photo No. 60 | Date: 09/20/10 | | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 6.5 | | | |


| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 61 | Date: 09/20/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 6.6 Pathmark/Marshalls pier | | | |
| Photo No. 62 | Date: 09/20/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 6.7 Kearny Car Wash | | | |



| PHOTOGRAPHIC LOG | | | |
|---|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 63 | Date: 09/20/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 6.8 Kearny Boat Launch at Riverbank Park | | | |
| Photo No. 64 | Date: 09/20/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 7.4 Riverbank Park | | | |



PHOTOGRAPHIC LOG



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|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 65 | Date: 09/20/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 7.7 Rapp's Boat Yard | | | |
| Photo No. 66 | Date: 09/20/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 7.7 Riverbank Park (On land) | | | |

| PHOTOGRAPHIC LOG | | | |
|---|--------------------------|---|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 67 | Date: 09/21/10 | | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 8.5 Kearny High School Crew Floating Dock | | | |
| Photo No. 68 | Date: 09/21/10 | | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 8.5 Northern end of Riverbank Park | | | |



| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 69 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 8.8 Baseball field | | | |
| Photo No. 70 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 9.0 Private boat dock | | | |

| PHOTOGRAPHIC LOG | | | |
|---|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 71 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 9.1 Firehouse Boat Launch | | | |
| Photo No. 72 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 9.1 Fishing observed next to firehouse | | | |



| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 73 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 9.1 Parkland | | | |
| Photo No. 74 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 9.5 Passaic Valley Sewer Commission Private Boat Launch | | | |


| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 75 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 9.6 Aquatic vegetation/mudflat near power lines | | | |
| Photo No. 76 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 9.6 Riverside County Park | | | |



| PHOTOGRAPHIC LOG | | | |
|---|--------------------------|---|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 77 | Date: 09/21/10 | | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 9.6 Riverside County Park (On land) | | | |
| Photo No. 78 | Date: 09/21/10 | | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 9.7 Riverside County Park | | | |



| PHOTOGRAPHIC LOG | | | |
|---|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 79 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 9.9 Passaic River Rowing Association Boathouse and Dock | | | |
| Photo No. 80 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 10.3 Multifamily Residential Building and Bulkheaded Shoreline | | | |

| PHOTOGRAPHIC LOG | | |
|--|--------------------------|---|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ |
| | | Project No. 60145884 |
| Photo No. 81 | Date: 09/21/10 | |
| Direction Photo Taken: Right (East) Bank | | |
| Description: RM 10.5 Riverside County Park | | |
| Photo No. 82 | Date: 09/21/10 | |
| Direction Photo Taken: Right (East) Bank | | |
| Description: RM 10.7 Riverside County Park | | |



| PHOTOGRAPHIC LOG | | | |
|---|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 83 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 11.0 Lyndt Park Boat Launch | | | |
| Photo No. 84 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 11.6 Montclair College Boathouse and Dock | | | |



| PHOTOGRAPHIC LOG | | |
|--|--------------------------|--|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ |
| | | Project No. 60145884 |
| Photo No. 85 | Date: 09/21/10 |  |
| Direction Photo Taken: Right (East) Bank | | |
| Description: RM 11.8 Private boat launch | | |
| Photo No. 86 | Date: 09/21/10 |  |
| Direction Photo Taken: Right (East) Bank | | |
| Description: RM 11.8 Private boat dock | | |

| PHOTOGRAPHIC LOG | | |
|--|--------------------------|--|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ |
| | | Project No. 60145884 |
| Photo No. 87 | Date: 09/21/10 |  |
| Direction Photo Taken: Right (East) Bank | | |
| Description: RM 11.9 Residential | | |
| Photo No. 88 | Date: 09/21/10 |  |
| Direction Photo Taken: Right (East) Bank | | |
| Description: RM 12.1 Nereid Boat Club | | |

| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 89 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 12.3 Residential | | | |
| Photo No. 90 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 12.6 Residential | | | |



| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|---|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 91 | Date: 09/21/10 | | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 12.7 Residential | | | |
| Photo No. 92 | Date: 09/21/10 | | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 12.7 Residential | | | |

| PHOTOGRAPHIC LOG | | |
|--|--------------------------|--|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ |
| | | Project No. 60145884 |
| Photo No. 93 | Date: 09/21/10 |  |
| Direction Photo Taken: Right (East) Bank | | |
| Description: RM 12.8 Private dock in residential area | | |
| Photo No. 94 | Date: 09/21/10 |  |
| Direction Photo Taken: Right (East) Bank | | |
| Description: RM 13.4 Rutherford Memorial Park | | |

| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 95 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 13.4 CPG Dock | | | |
| Photo No. 96 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 13.8 Memorial Park (On land) | | | |

| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 97 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 14.0 Residential | | | |
| Photo No. 98 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 14.3 Boat Ramp | | | |

| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|---|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 99 | Date: 09/21/10 | | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 14.3 Residential | | | |
| Photo No. 100 | Date: 09/21/10 | | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 14.5 | | | |

| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|--|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 101 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 14.6 Boat Ramp | | | |
| Photo No. 102 | Date: 09/21/10 |  | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 15.2 Residential | | | |

| PHOTOGRAPHIC LOG | | | |
|--|--------------------------|---|--------------------------------|
| Site Name: Lower Passaic River Restoration Project | | Site Location: Lower Passaic River Study Area, NJ | Project No. 60145884 |
| Photo No. 103 | Date: 09/21/10 | | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 15.5 Confluence with Saddle River | | | |
| Photo No. 104 | Date: 09/21/10 | | |
| Direction Photo Taken: Right (East) Bank | | | |
| Description: RM 15.6 | | | |